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SECURITIES CLEARING AND SETTLEMENT IN CHINA

MARKETS, INFRASTRUCTURES AND POLICY-MAKING

by Patrick Hess

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In 2010 all ECB publications feature a motif taken from the €500 banknote.

1 The research that this paper summarises has benefited largely from meetings held in November 2009 in Beijing between the author and representatives of the People's Bank of China (PBC), the Chinese securities regulator, the two mainland CSDs and the National Clearing Center of the PBC. The author is indebted to those institutions and representatives for the support and information provided, and assumes full responsibility for any mistakes. He is also grateful for the support and comments received within the ECB. The Renminbi (RMB) conversion rates used in the paper are RMB 9.60:1 for EUR and RMB 6.83:1 for USD.

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ABSTRACT

China is taking a more active role on the world stage, even more so since its rapid and strong recovery from the global recession. In the financial realm this expansion is underpinned by a strategy to build strong and competitive capital markets at home. In order to achieve this goal, well-functioning and sound securities infrastructures are an important pre-requisite, and therefore they receive a lot of attention from Chinese policy-makers, as well as from market participants both in China and abroad.

This paper evaluates the current market infrastructure, including the legal and regulatory framework, for securities trading, clearing and settlement in mainland China, and analyses the policy-making in this field. The paper finds that, following huge progress in recent years, the post-trading processes are increasingly safe and efficient. It concludes that, given the effectiveness of the policy process, Chinese clearing and settlement are likely to develop into the "modern financial support systems" which the authorities envisage, and which will also be increasingly connected and integrated with other securities markets of global importance.

Key Words: China, securities market, clearing and settlement, market infrastructure, policy-making

JEL Classification: E58, G15, G18, G21, G28, P34

INTRODUCTION AND SUMMARY

Since the financial crisis of 2008, the global importance of emerging markets like China, which have become engines of growth, has increased. China uses this fact to actively expand its financial and economic influence around the globe, be it by promoting the international use of the Renminbi (RMB), by increasing China's IMF and World Bank quota and voting rights, or by acquiring or trying to acquire strategic foreign assets and natural resources. While these initiatives are making the headlines, what is generally less well known is Beijing's strategy to underpin its global expansion with an advanced financial system and in particular effective and efficient capital markets at home. Such capital markets require well-functioning operational support systems like clearing and settlement systems, which explains the high attention those systems increasingly receive from Chinese leaders and policy-makers.

Although mature economies in North America and Europe dominate global payments and settlement today, China is expected to play a major role in the future. One does not need a crystal ball to predict that in particular securities settlement volumes will grow, mainly domestically due to the growing importance of capital markets for financing, but also across borders due to the increasing investments of Chinese companies abroad and of foreigners in China.

Against this background of the inherent growth potential of Chinese post-trading and the "larger plan" behind its promotion, this Occasional Paper aims, on the one hand, at increasing the knowledge of securities trading, clearing and settlement in mainland China. On the other hand, it tries to explore the policy-making dimension to better understand the strategic, institutional and procedural aspects behind market infrastructure development in China.

This endeavour is warranted from two perspectives: from a public policy perspective because there is a global convergence of standards for payment systems and also securities settlement systems; and from a private sector perspective because global investors increasingly seek to participate in the growth of Chinese capital markets, of which clearing and settlement are important and critical parts. At the same time, relatively little information on Chinese post-trading is available in Western languages, and none is available on the policy-making aspect. The intention of this paper is to fill that gap.

The *main findings* of the study are the following: The importance and sophistication of Chinese securities markets have, despite a lack of integration and openness, grown over the last twenty years and are expected to grow further. An increasingly sound legal infrastructure and a comprehensive regulatory structure, with the China Securities Regulatory Commission (CSRC) and the People's Bank of China (PBC) as the main authorities, have evolved over time. The trading layer comprises the stock exchanges in Shanghai and Shenzhen, as well as the interbank bond market. The clearing and settlement layer consists of two central securities depositories (CSDs) serving the stock exchange market and the interbank bond market. The CSD for the stock exchanges also acts as a central counterparty (CCP), and a separate institution has just been set up, which is likely to act as a CCP for the interbank bond market. All in all, the post-trading infrastructure and processes are technically efficient and safe, although delivery-versus-payment (DVP) settlement is not applied to the same degree in the two CSDs.

The PBC and the CSRC are the main policy-makers in the post-trading area. Policy objectives are investor protection as well as safety and efficiency, and policy implementation seems to be quite effective, whether it be in the area of operating, regulating or developing the market infrastructure. Due to its operational role, the PBC has a certain institutional advantage over the CSRC, which may explain the different extent of DVP implementation in the stock exchange and interbank bond markets. In general, the huge efforts and leadership attention in the field of payment and settlement system development in recent years suggest that there is a high degree of consensus on its importance and on the long-term strategy behind it.

The report is structured as follows: First, Part 1 looks into the structure, instruments, size and participants of the stock and bond markets (Sections 1.1 and 1.2) and describes the legal and regulatory framework for securities (Section 1.3). Then, Part 2 introduces the two Chinese CSDs (Section 2.1) and presents the main principles, procedures and risk mitigation techniques of their clearing and settlement processes (Section 2.2), the history of their adoption of DVP settlement (Section 2.3), as well as their linkages and international activities (Section 2.4). Finally, Part 3 focuses on the post-trading policy-making process by analysing its objectives (Section 3.1), the different roles of the central bank (Section 3.2), the aspect of consensus-building (Section 3.3), as well as organisational aspects (Section 3.4).

I SECURITIES MARKETS IN CHINA

China's securities markets consist of two main markets: the stock market and the bond market. Their sophistication and importance for the economy have increased steadily over the last two decades, leading also to the gradual development of a comprehensive legal and regulatory framework for holding and transferring securities.

1.1 THE STOCK MARKET

1.1.1 STRUCTURE AND INSTRUMENTS

There are three stock exchanges in the People's Republic of China (PRC): the Shanghai Stock Exchange, the Shenzhen Stock Exchange, and the Hong Kong Stock Exchange.[1] Unlike the latter, the former two are not entirely open to foreign investors due to capital account controls exercised by the Chinese mainland authorities. Apart from stocks and funds, bonds are also listed and traded on the Shanghai and Shenzhen stock exchanges (see Section 1.2.1 below). The Shanghai Stock Exchange and the Shenzhen Stock Exchange are non-profit organisations directly administered by the China Securities Regulatory Commission (CSRC).[2]

Currently there are four different types of stock issued by Chinese mainland companies, with the following characteristics and restrictions:

- "A shares" (common shares): listed in Shanghai and Shenzhen, denominated, traded and settled in RMB; only domestic investors and selected foreign institutional investors – under the QFII[3] program launched in 2003 – are allowed to trade in A shares

- "B shares" (special shares): listed in Shanghai and Shenzhen, denominated in RMB and traded/settled in USD (Shanghai) or HKD (Shenzhen); only foreign (institutional or individual) investors, including investors from Hong Kong, Macau and Taiwan, can trade in B shares

- "H shares": listed on the Hong Kong Stock Exchange, denominated, traded and settled in HKD

- "N shares": listed on the New York Stock Exchange, denominated, traded and settled in USD

The original reason for the segmentation of the Chinese stock market was to protect it against high volatility in world markets and control of Chinese companies by foreign investors, reflecting a fear of external dependence visible also in other policy areas and rooted in China's history. Nowadays there are plans to eventually merge A and B shares in the future, but no exact timetable exists.

Many companies float their shares simultaneously on the Hong Kong market and one of the two mainland stock exchanges. Price discrepancies between the H shares and the A shares of the same company are not uncommon. A shares generally trade at a premium to H shares due to the above-mentioned restrictions on foreigners investing in A shares, as well as restrictions on mainland Chinese people investing abroad.

The most commonly used indicators to reflect the market performance of the three stock exchanges are the Hang Seng Index in Hong Kong, the Shenzhen Stock Exchange 100 Index and the Shanghai Stock Exchange Composite Index. The development of the latter since 1991 is depicted in Chart 1 (in December 2009, the index stood at around 3,000).

1 The Shanghai and Hong Kong stock exchanges were both founded in 1891, with the first informal securities exchanges in these two ports dating back to as early as 1861. The Shanghai Stock Exchange was re-established in 1990, when the Shenzhen Stock Exchange was also set up.

2 See Section 1.3.1 below. The three mainland Chinese futures exchanges in Shanghai, Dalian and Zhengzhou, which are also regulated by the CSRC, are not covered in this paper.

3 *Qualified Foreign Institutional Investor* – as at May 2010, a total of 96 foreign institutional investors had been approved under the QFII program (see www.csrc.gov.cn). Quotas under the QFII program currently amount to USD 30 billion.

Chart 1 Shanghai (SSE) Composite Index from 1991 to the start of 2009

Source: http://en.wikipedia.org/wiki/Shanghai_Stock_Exchange, retrieved on 22 December 2009.

1.1.2 MARKET SIZE AND PARTICIPANTS

By end-2008, an accumulated amount of RMB 333 billion (€35 billion) had been raised in the *primary market* for A shares (new issues), decreasing by 57% from 2007 as a result of the financial crisis. After the Lehman Brothers collapse in September 2008, there was an unofficial ban on IPOs, which was lifted again in May 2009.

At the end of 2008, 1,625 corporations had been listed on the Shanghai and Shenzhen stock exchanges, compared with less than 800 in 1997 and only 53 in 1992.[4] The great majority of those companies (94%) are listed as A shares, which also account for almost 100% of market capitalisation and trading turnover in Shanghai and Shenzhen. The listed companies include 28 financial corporations, which at the end of 2008 accounted for 33% of the total market capitalisation, the highest ratio of all industries. As a result of the crisis, Chinese banks now hold the top positions as the largest banks in the world by market value.

The impact of the global economic crisis also affected the *secondary market*. At year-end 2008, the market capitalisation of A shares was RMB 12 trillion (€1,250 billion), decreasing by 63% from 2007. The total trading of the Shanghai and Shenzhen stock exchanges in 2008 amounted to 2.4 trillion shares worth RMB 26.71 trillion (€2,782 billion). The turnover decrease over 2007 was 42%, which however followed an increase from RMB 9 trillion (in 2006) to RMB 46 trillion (in 2007) caused by the equity boom in 2007 that made China's stock market temporarily the world's second largest in terms of turnover after the US. The number of investor accounts has constantly grown over the last decade and by end-2009 amounted to 144.3 million accounts in the A share market and 2.5 million accounts in the B share market.

1.2 THE BOND MARKET

The bond market in mainland China has a multi-layered structure, comprising the interbank bond market, the exchange bond market and the bank counter market, with the interbank bond market being the dominant trading venue.

1.2.1 STRUCTURE AND INSTRUMENTS

INTERBANK BOND MARKET

The interbank bond market is a quote-driven OTC market outside the exchanges. It is regulated by the People's Bank of China (PBC) and functions as a wholesale market for institutional investors. Deals are struck based on bid and ask prices negotiated between two trading counterparties. The interbank bond market was formed in June 1997 when the PBC, under the instruction of the State Council, mandated[5] that all commercial banks move their repo and bond trading away from the Shanghai and Shenzhen stock exchanges and onto an interbank market operating through an electronic trading system. Banning the banks from participating in trading on the exchanges was partly motivated by their role in the equity and real estate bubbles in the early 1990s, but

4 CSRC, *China Securities and Futures Statistical Yearbook 2009* [for 2008], Shanghai, September 2009, pp. 4-5.

5 Via the *Notice on Cessation of Repo and Bond Trading by Commercial Banks in the Stock Exchanges* (PBC Notice No. (1997) 240). See Mu Huaipeng, "The development of China's bond market", in: Bank for International Settlements, *Developing corporate bond markets in Asia* (BIS Papers No. 26), February 2006, p. 56.

was mainly aimed at insulating the Chinese banking system from market risks associated with exchange transactions. Today, more than ten years later, the interbank bond market is by far the biggest bond market in China, accounting for more than 90% of the total custody and trading volume. Apart from using the Interbank Trading System of the National Interbank Funding Center (also known as CFETS), counterparties can also negotiate deals directly via bilateral contracts.

Compared with the two other markets, participants in the interbank bond market have access to a broad array of trading instruments like government bonds, central bank bills, different types of financial bonds and non-financial corporation bonds, asset-backed securities and *panda bonds* (RMB-denominated bonds issued by international development institutions).[6] The interbank bond market is also where the PBC conducts its open market operations. The central bank bill, corporate commercial paper and the mid-term note, three instruments that are solely traded in the interbank bond market, are by far the most actively traded products in the Chinese bond market.

EXCHANGE BOND MARKET

The exchange bond market is an order-driven market, where bonds are traded, alongside equities, on an exchange. It is regulated by the CSRC. Small and medium-sized institutions as well as individuals are the main players in this market and usually access it via brokerage services provided by the stock exchanges in Shanghai and Shenzhen (see Section 1.1.1 above). Although commercial banks are currently still prohibited from trading in the exchange bond market, the State Council has recently approved a new regime for granting qualified listed commercial banks access to it, which is currently in a pilot phase and will, if it is successful, be completely implemented. The main instruments traded in the exchange bond market are government bonds and (lower-rated) corporate bonds with medium to long-term maturities. Corporate bonds have been boosted by the fact that they are usually guaranteed by one of the state-owned banks.

BANK COUNTER MARKET

The bank counter market is a retail bond market offered by commercial banks. It is regulated by the PBC. Targeting mainly individual investors, it complements the other two bond markets, although the varieties of bond instruments available in this market are rather limited, with mainly government bonds in the form of book-entry bonds and electronic saving bonds available. *Electronic saving bonds* are mainly sold at banks. They target individual investors and channel household savings directly into national construction funds. The issuing process is relatively simple. Saving bonds cannot be traded, but they can be used as collateral and if needed sold back to banks before maturity.

1.2.2 MARKET SIZE AND PARTICIPANTS

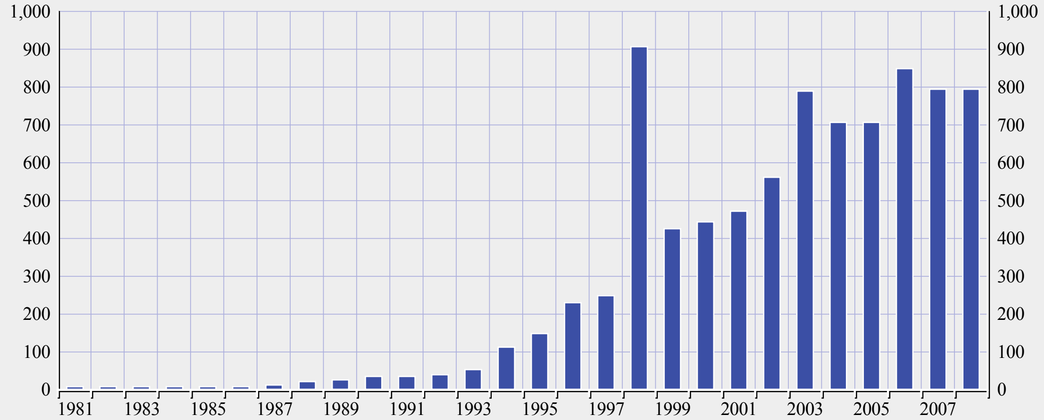
At the end of 2008, the total amount of bonds outstanding was RMB 14.2 trillion (€1,479 billion), increasing by 23% from 2007, and consisting of RMB 13.9 trillion (97.8%) in the interbank bond market, RMB 313 billion (€33 billion) in the exchange bond market and less than RMB 1 billion in the bank counter market. In 2008, the total issuance of all kinds of bonds amounted to RMB 7.15 trillion (€745 billion), decreasing by 11% from 2007, and consisting of RMB 7.07 trillion (nearly 99%) in the interbank bond market and RMB 79 billion (€8 billion) in the exchange bond market.

The single most important bond category is central bank bills, the issuance of which has grown from RMB 723 billion (€75 billion) in 2003 to RMB 4.3 trillion (€448 billion) in 2008. They are issued by the PBC to members of the interbank bond market, with the majority of maturities lying between three months and one year. In 2003, short of government bonds needed for open market operations, the PBC started to issue its own central bank

6 So far, three panda bonds have been issued in 2005 and 2006, two by the International Finance Corporation of the World Bank Group and one by the Asian Development Bank, totalling RMB 3 billion. For a comprehensive description of the major bond instruments, issuers and investors, see Standard & Poor's, *An introduction to Chinese bond markets*, March 2009, pp. 7-24.

Chart 2 Chinese government bond issuance from 1981 to 2008

(in RMB billions)



Source: Standard & Poor's (2009), exhibit 1, p.4, based on Wind Info data.

"sterilisation" bills to absorb extra market liquidity.[7] Due to its simplicity and flexibility, the central bank bill quickly became not only the most important monetary tool for open market operations in China, but also one of the most actively traded instruments and thereby a useful benchmark.

As an example of the steady development of Chinese bond markets over the last three decades, Chart 2 shows the historical issuance of government bonds since 1981. The peak in 1998 was caused by aggressive fiscal policies in the aftermath of the Asian financial crisis.[8]

A segment that has received a lot of attention from the authorities in recent years – and hence also from investors – is the corporate bond market. Following the enactment in December 2004 of administrative rules allowing the circulation of corporate bonds in the interbank bond market, it has grown considerably and by end-2008 was almost as big as the government bond market in terms of issuance (RMB 844 billion compared with RMB 856 billion).[9] However, in terms of outstanding bonds, at the end of 2008 corporate bonds only accounted for 8.4% of China's total, well below approximately 20% in the US.

The major *issuers* in the Chinese bond market are the central government (mainly the Ministry of Finance, and to a lesser extent also the Ministry of Railways), the PBC, the three policy banks[10] (China Development Bank, Export-Import Bank of China, Agricultural Development Bank of China), commercial banks, the China International Trust and Investment Corporation (CITIC) and other non-bank financial institutions, as well as listed companies and other enterprises.

The major *investors* are – in order of importance – commercial banks, insurance companies, mutual funds, securities companies, the National Social Security Fund (NSSF), occupational pension funds, non-bank financial institutions, enterprises, QFIIs and individual investors. All those have direct access to the

7 They are called *sterilisation bills* because the central bank issues and sells these bills to "sterilise" the growth in money supply stemming from its foreign exchange interventions to keep the Renminbi exchange rate stable (the PBC buying USD against RMB).

8 See Takeshi Jingu, "China's Government Bond Market", Nomura Capital Market Review Vol. 11 No. 1, 2008, p. 28.

9 CSRC (2009), p. 7.

10 *Policy banks* are owned and backed by the government and can issue bonds at much lower cost than commercial banks. The funds raised are usually used to finance key national projects not covered by the fiscal budget (supplement of fiscal funds).

interbank bond market, except the NSSF, occupational pension funds and individual investors, which can access it via (qualified) securities firms acting as fund managers or brokers. Commercial banks are the main market participants for both primary and secondary bond markets.

The number of institutional investors in the interbank bond market has risen from 315 at the end of 2000 to 9,247 at the end of 2009, mainly due to the huge increase in the number of enterprises during that period. In the bank counter market, which started in 2002 with a trial of trading book-entry government bonds over the counters of the four big state-owned commercial banks (Bank of China, China Construction Bank, Industrial and Commercial Bank of China, Agricultural Bank of China), there were nearly 7.6 million investor accounts by end-2009.[11]

1.3 LEGAL AND REGULATORY FRAMEWORK

1.3.1 REGULATORY STRUCTURE

China follows a sectoral supervision model for its financial industry, with banking, insurance and securities sectors being under separate supervision by the China Banking Regulatory Commission (CBRC), the China Insurance Regulatory Commission (CIRC) and the *China Securities Regulatory Commission (CSRC)* respectively.[12]

The Beijing-based CSRC (in Chinese abbreviated as *Zhengjianhui* 证监会) was established in 1992 and is an institution with ministerial rank under the State Council of the PRC. Its current Chairman is Mr SHANG Fulin 尚福林. Since 1999, when the PBC was also reorganised in the post-Asian financial crisis financial sector reforms to increase its ability to implement monetary policy, the CSRC has been the *main securities regulator* on the mainland. Its functions are similar to the SEC in the US. By end-2008, it had 2,512 staff members, of which 649 were located in the Beijing headquarters and the rest in various regional offices.[13] Its statutory regulatory duties and measures are set forth in Articles 179 and 180 of the *Securities Law of the People's Republic of China* (first adopted in 1998) respectively, granting the CSRC for example the authority "to implement a centralized and unified regulation of the nationwide securities markets in order to ensure their lawful operation" and the authority "to investigate, and impose penalties for, illegal activities related to securities and futures". The policy objectives of the CSRC are investor protection as well as safety, efficiency and the "low cost" of the securities market infrastructure. To achieve these objectives, one important focus of the regulatory work of the CSRC is the management of risks related to clearing and settlement, mainly legal, credit, operational, technical and liquidity risks.

As mentioned above, the *PBC* is responsible for regulating the interbank bond market and the bank counter market. In addition, the *Ministry of Finance (MOF)* is accountable for the management of the primary and secondary government bond markets. To supplement the regulatory efforts of the CSRC, the PBC and the MOF, *self-regulatory organisations* (including the two stock exchanges), the Securities Association of China (SAC), the China Futures Association (CFA), as well as the two CSDs (see Section 2.1 below), conduct self-regulation and front-line supervision over securities trading and post-trading activities of their members, participants or listed companies.

The legal basis for the *regulatory role of the PBC* in the field of securities is included in the *Law of the People's Republic of China on the People's Bank of China*. Whereas its original version of March 1995 only refers to "the supervision and control of the financial

11 For 2009 figures see the monthly statistics at http://www.chinabond.com.cn/Site/cb/en, retrieved on 14 January 2010.
12 Like the PBC head office, all three Commissions are located in *Beijing Financial Street*, an area within the second ring road, which is China's "financial regulation center" and also called China's Wall Street although it does not include a stock exchange.
13 CSRC, *Annual Report 2008*, May 2009, p. 7.

market", the amended version of December 2003 specifies "the regulation and supervision of the interbank lending market and the interbank bond market" as one of the functions assumed by the PBC (Article 4, indent 4). Article 32 stipulates further that the PBC may check the compliance of financial institutions, other institutions and individuals with regulatory rules on the interbank lending market and the interbank bond market. Within the PBC, the Financial Market Department (FMD) carries out these regulatory tasks (see Section 3.4 below). More specifically, the FMD is responsible for drafting regulations for the interbank lending market and the interbank bond market, granting access to those two markets, analysing the impact of market instruments on monetary policy and financial stability, guiding the National Interbank Funding Center (main trading venue; see Section 1.2.1 above) and the CDC (the CSD for the interbank bond market), monitoring market activities and risks, as well as fostering product innovation and "an orderly market development". In addition, the PBC oversees securities settlement systems (see Section 3.2 below).

1.3.2 LEGAL FRAMEWORK

The safety of trading, clearing and settlement depends on the soundness of the legal infrastructure on which they are built. In China, as in other countries, the legal provisions for holding and transferring securities have followed the progress of capital markets, becoming more complex and sophisticated over time. This can be illustrated by the fact that the 1998 version of the *Securities Law*, the nation's first comprehensive securities legislation, contained nothing on clearing and settlement, while clearing and settlement were widely covered in the 2005 revision of the law.[14] This revision took the experience gathered during the preceding eight years into account and is generally regarded as a big step forward in achieving legal certainty in this field. As a result of the "great importance attached by China to the construction of market infrastructures, especially the development of a sound underlying statutory framework",[15] in recent years a comprehensive legal framework for financial instruments has evolved.

Today, a *hierarchical legal system* exists, which consists of three tiers of provisions with a decreasing level of legal authority and an increasing level of detail: the foundation and first tier are *state laws* set by the National People's Congress, the Chinese legislative body, like the *Securities Law*, the *Company Law*, the *Fund Law* and other relevant laws. The second tier is made up of *regulations* laid down by the responsible regulator (see Section 1.3.1), for example the CSRC's *Measures for the Administration of Securities Registration and Settlement* (hereafter called "*Measures*"), the PBC's *Regulations on Trading in the Interbank Bond Market*, or the MOF's *Temporary Provisions on Managing the Custody of Government Bonds*. The third tier consists of the *rules and procedures* of the two Chinese CSDs, like those on accounting, registration, custody, settlement, and general or specific (e.g. for repo transactions) master agreements for signature by their participants.

For example, with regard to the *management of securities accounts*, the different provisions stipulate that:

- investors must hold securities through securities accounts, which are used to record the balances and changes of their securities positions;[16]

- the *real name system* ensuring that securities are held under the real name of the account owner has to be applied (Articles 80, 166 and 168 of the *Securities Law*, Articles 19-20 of the *Measures*); and

- it is the responsibility of the CSDs and securities companies to perform anti-money laundering checks when investors open and use securities accounts. It is in this context that a massive clean-up took place in 2006 and 2007 to close or freeze dormant and suspicious CSD accounts.

14 Mainly in Chapter VII, Articles 155-168.
15 Citation; see "Appendix 2: Key aspects of the Securities Regulatory System" in CSRC, *Annual Report 2008*, p. 50.
16 Since 1993, securities are completely dematerialised in China and held/transferred only via book-entries on securities accounts.

2 POST-TRADING INFRASTRUCTURE AND PROCESSES

2.1 CLEARING AND SETTLEMENT INSTITUTIONS

In mainland China there are two CSDs, the China Securities Depository and Clearing Co. (SD&C), which serves the two stock exchanges and also acts as a CCP for them, and the China Government Securities Depository Trust & Clearing Co. (CDC), which serves the interbank bond market. Bond settlement of the two mainland stock exchanges is also handled by the SD&C.

2.1.1 THE CHINA SECURITIES DEPOSITORY AND CLEARING CO. (SD&C)

Following the approval of the CSRC and agreement of the State Council, the China Securities Depository and Clearing Corporation (Chinese abbreviation: *Zhongzhengdeng* 中证登) was founded on 30 March 2001 in accordance with the *Securities Law* and the *Company Law*. In particular, its establishment fulfilled the requirements of the *Securities Law* for centralising the operations for registering and settling securities. The SD&C's headquarters are located in Beijing. Its two branches in Shanghai and Shenzhen were established in September 2001, and as of 1 October 2001 they took over the complete registration and settlement business of the Shanghai and Shenzhen stock exchanges, which are also the shareholders of the SD&C, each holding 50% of its registered capital of RMB 1.2 billion. The supervisory authority of the SD&C is the CSRC.

In line with the relevant stipulations of the *Securities Law* and the *Measures*, the main functions of the SD&C include (hereafter *key concepts* in brackets and italics):

- *Management of* securities and settlement *accounts* (*zhanghu guanli* 账户管理)
- *Depository* (*cunguan* 存管) and transfer of ownership of securities
- *Registration* (*dengji* 登记) of securities holders and of their rights and interests
- *Clearing* (*qingsuan* 清算) and *settlement* (*jiaoshou* 交收 or *jiesuan* 结算) as well as management of cash and securities
- Distribution of securities rights and interests on behalf of issuers (corporate actions)

In 2008, the SD&C settled almost 4 billion transactions with a value of RMB 64 trillion (€6.66 trillion). Compared with 2007, this meant a decrease of 21.4% in terms of volume and 34.6% in terms of value, mainly due to the decreased trading activity caused by the crisis. However, in 2009 settlement volumes quickly picked up again, resulting in a total for the whole year 2009 of almost 7 billion transactions worth RMB 129.6 trillion (€13.5 trillion)[17]. This last figure is still relatively low compared with turnovers in the US and Europe – for example, in 2008 the Depository Trust & Clearing Corporation (DTCC) settled €1,337 trillion (USD 1,880 trillion), and Euroclear approximately €569 trillion worth of transactions[18] – but the Chinese growth potential is clear. In 2008, the SD&C achieved a total settlement efficiency of 97%.[19] From a technical perspective, there is no system integration between the SD&C Shanghai and the SD&C Shenzhen, so that the two branches act *de facto* as separate CSDs for the two stock exchanges.

2.1.2 THE CHINA GOVERNMENT SECURITIES DEPOSITORY TRUST & CLEARING CO. (CDC)

In order to establish a safe, efficient and low-cost bond market, the PBC and the MOF jointly proposed to establish the China Government Securities Depository Trust & Clearing Corporation (abbreviated as *Zhongzhaideng*

17 See SD&C, *Yewu tongji yuebao* 业务统计月报 (Monthly business statistics report), December 2009, p. 2, retrieved on 26 January 2010 from http://www.chinaclear.cn/main/03/0304/0304_1.html
18 See DTCC, *Annual Report 2008*, p. 4, and Euroclear, *Annual Report 2008*, p. 9. To make the figures fully comparable, a considerable part of the CDC business would need to be added to the SD&C figures, but the value gap would still be huge.
19 CSRC, *Annual Report 2008*, p. 77.

中债登). With their approval and the agreement of the State Council, the CDC was set up in December 1996 as the designated central institution to provide bond depository, *custody* (*tuoguan* 托管) and *settlement* (*jiesuan*) services for China's interbank bond market. The CDC is based in Beijing. It is completely state-owned and has a registered capital of RMB 480 million (€50 billion). Its supervisory authority is the PBC.

The CDC is a non-bank financial institution, which offers issuance, registration, custody, settlement, and principal redemption/interest payment agency services for government bonds, financial debentures, corporate bonds, and other fixed-income securities, as well as for bond funds and money market funds. It provides first-tier custody services for the whole bond market, with the SD&C acting as sub-custodian for the exchange bond market, and the four big commercial banks acting as sub-custodians for the bank counter market.

In 2008, the CDC settled more than 345,000 transactions with a value of RMB 104.6 trillion (USD 15.3 trillion). Compared with 2007, this was an increase of 62% in terms of volume and 66% in terms of value, meaning that the growth of previous years continued despite the crisis, which according to the CDC had "almost no impact" on transaction volumes in the interbank bond market. The value of transactions settled from January until October 2009 amounted to RMB 105 trillion.

2.2 CLEARING AND SETTLEMENT PROCESSES

Based on information provided by the PBC and the two Chinese CSDs, the main features of the post-trading processes in the SD&C and the CDC are described below.[20]

2.2.1 SD&C

BOOK-KEEPING PRINCIPLES

Predominantly a *direct holding* (*zhijie chiyou* 直接持有) method is applied with book entries for A share investors being made directly on end-investor accounts held in the SD&C. Only for the much smaller B share segment, an *indirect holding* (*jianjie chiyou* 间接持有) method with nominee accounts is used. This difference stems from the fact that overseas markets have other jurisdictions and shareholder systems than China. Segregated end-investor accounts are also maintained in the booking systems of the securities companies, and at the end-of-day (18:00), end-investor positions are reconciled between the SD&C and the securities companies.

CLEARING AND SETTLEMENT PRINCIPLES

The SD&C is responsible for the clearing and settlement of stocks and bonds traded on the Shanghai and Shenzhen stock exchanges. After completion of the trades, they are sent from the stock exchange to the respective SD&C branch, which applies the following clearing and settlement principles:

- *Tiered settlement* (*fenji jiesuan* 分级结算) : While the SD&C is responsible for the settlement with securities companies or direct investors (first tier), securities companies are responsible for the settlement with their clients (second tier).

- *Multilateral netting* (*duobian jing'e jiesuan* 多边净额结算 or *duobian gacha* 多边轧差): For the majority of trades between the securities companies/direct investors, their resulting obligations to deliver securities or cash are netted by the SD&C on a multilateral basis.

- *Central counterparty* (*zhongyang duishou* 中央对手 or *gongtong duishoufang* 共同对手方): The SD&C acts as a central counterparty (CCP) to the counterparties of a securities transaction. If a trading counterparty defaults on its obligation in securities or cash,

20 Although Francis Braeckevelt, "Clearing, settlement and depository issues" in: Bank for International Settlements, *Asian bond markets: issues and prospects* (BIS Papers No. 30), November 2006, pp. 284-332, contains useful information on post-trading in China, he only covers the SD&C, not the CDC and the interbank bond market. Some basic information on both the SD&C and the CDC is included in EMEAP Working Group on Payment and Settlement Systems, *Payment Systems in EMEAP Economies*, July 2002, pp. 78-85.

the SD&C fulfils the obligation on behalf of the defaulter.

- *Settlement reserve fund* (*jiesuan beifujin* 结算备付金): In order to contain *settlement risk* (*jiesuan fengxian* 结算风险), each securities company/direct investor must maintain a daily minimum balance in its cash settlement account as a "settlement reserve fund", the amount of which is set by the SD&C.

SETTLEMENT ACCOUNTS

The SD&C is responsible for a standardised management of *securities accounts* (*zhengquan zhanghu* 证券账户), including the opening of securities accounts, and the deposit and transfer of securities. Each settlement participant (*jiesuan canyuren* 结算参与人), which can be a securities company or direct investor, needs to open securities accounts with the SD&C to deposit the securities of its clients or its own securities. To perform settlement, the SD&C maintains – for its deliveries or receipts as a CCP – a Centralised Securities Settlement Account, and each settlement participant must – under its own name and legal person – open a Securities Settlement Account with the SD&C for securities deliveries or receipts between itself and the SD&C.

With regard to *cash accounts* (*zijin zhanghu* 资金账户), the situation is as follows: each settlement participant must open a dedicated cash account with one of the *settlement banks* (*jiesuan yinhang* 结算银行)[21] as well as a Fund Settlement Account with the SD&C to deposit its minimum settlement reserve fund and to settle the cash positions between itself and the SD&C. In addition, the SD&C has opened a deposit account with each settlement bank for receiving and transferring the cash positions resulting from securities settlement. For cash settlements in its role as a CCP, the SD&C maintains in addition a Centralised Fund Settlement Account, from or to which the net cash proceeds are booked to or from the Fund Settlement Accounts of the settlement participants.

SETTLEMENT PROCEDURE

The first-tier settlement between the SD&C and the securities companies/direct investors consists of two phases, the *clearing* (*qingsuan*) and the *settlement* (*jiaoshou*) phase.

- *Clearing phase*: At the end of the trading day T, the SD&C calculates the net amounts of cash and securities receivable and payable by each settlement participant according to the multilateral netting principle, and informs them accordingly before midnight (24:00) on T.

- *Settlement phase*: At the end of day T (18:00), the SD&C completes in its role as a CCP the settlement of securities delivery obligations between itself and the settlement participants by directly debiting or crediting their Securities Settlement Accounts, with the securities being transferred on a final and irrevocable basis.

For the majority of transactions (A shares and bonds), the *net fund movement* occurs *one day after* the *final movement of securities*: On T+1, each settlement participant with a payment obligation transfers the funds from its dedicated cash account to the deposit account of the SD&C with that settlement bank. At 16:00 on T+1, the SD&C completes the fund settlement by directly debiting or crediting the Fund Settlement Accounts of the settlement participants.

For B shares, cash is paid on a net basis on T+3. The SD&C explained this longer settlement cycle by the different time zones involved for B share investors (e.g. Europe and the US).

Since DVP settlement requires that the movement of securities and the movement of

21 Currently there are 16 *settlement banks* designated by the SD&C, which are all commercial banks. Their systems are all directly linked with the SD&C. In October 2009, the SD&C had approximately 200 different settlement participants, which can freely choose one of the settlement banks according to their needs and risk preferences.

funds depend on each other (i.e. securities are delivered only if payment occurs), this means that *no DVP settlement exists for* transactions in *A shares, B shares and bonds*, which form the majority of the SD&C settlement business.

Only for exchange-traded funds (ETFs), options and a few other products, the SD&C currently applies a DVP settlement mechanism with cash and securities settling simultaneously and irrevocably on T+1. The DVP model is an interfaced model, which is also applied by the CDC (see Section 2.3 below).

SETTLEMENT RISK MITIGATION

Although DVP settlement is currently applied only for a minority of transactions, "risks are completely controlled", according to the SD&C. The main risk mitigation instrument is the *settlement reserve fund*. In addition, brokers (i.e. securities companies) check the availability of securities/cash with the appointed custodian/settlement bank before executing trades, and trades are rejected in the event of insufficient holdings. Once executed, trades are binding on the brokers. There are no buy-in/sell-out rules. In case of an overdraft, the SD&C imposes interest penalties based on the amount of the overdraft and holds securities as collateral.[22] Auto-collateralisation currently does not exist within the SD&C.

Since 2005, *short-selling* (*maikong* 卖空) is no longer prohibited by law, but with two exceptions, its use is still rather limited: To help primary dealers and market-makers respectively, short-selling was introduced in 2008 on the exchange bond market in Shanghai, and in 2007 on the interbank bond market. Although strictly speaking not prohibited, *securities financing* (*rongzi rongquan* 融资融券) was not practiced until recently, when it started to get promoted and was formally introduced in the SD&C with effect from 31 March 2010.

In addition to the above, the SD&C has established a *settlement guarantee fund* (*jiesuan hubaojin* 结算互保金), which is used to cover losses incurred by settlement participants that do not meet their delivery or payment obligations. The settlement guarantee fund is financed by the settlement participants according to a formula set by the SD&C. Furthermore, in accordance with a regulation of the Ministry of Finance and the CSRC,[23] the SD&C administers a *securities settlement risk fund* (*zhengquan jiesuan fengxian jijin* 证券结算风险基金), which is used to cover any unavoidable losses for the CSD resulting from settlement failures, technical incidents or operational errors. This fund is initially funded with 20% of the net revenue/profit of the CSD and further funded according to a certain ratio of the overall equity, fund, bond and repo trading volume of the settlement participants. The upper limit of the fund is currently set at RMB 3 billion (€312 million).

2.2.2 CDC

Currently no clearing layer exists and only *gross settlement* (*quan'e jiesuan* 全额结算) is used. According to the CDC, the design of a netting functionality has already been finalised, and as soon as it receives the necessary approval by the PBC, *net settlement* (*jing'e jiesuan* 净额结算) might be introduced. However, after the recent foundation of the Shanghai Clearing House (see Section 3.2.3 below), it is more likely that this new institution will in the future act as a CCP, rather than the CDC performing that function itself as the SD&C does.

BOOK-KEEPING AND SETTLEMENT PRINCIPLES

Predominantly the *direct holding* method (98%) is applied, with end-investor securities accounts for the interbank bond market being held directly in the CDC. For the exchange bond market and the bank counter market, the indirect holding method (2%) is used, with the sub-custodians, the SD&C and the four big commercial banks holding the securities in the books of the CDC on behalf of the beneficial owners.

To carry out its functions, the CDC has set up a centralised bond business system, consisting

22 See Braeckevelt (2006), p. 324.

23 The *Notice on the Promulgation of the Measures for the Administration of the Securities Settlement Risk Fund* (CSRC Notice No. (2006) 65).

of several components. Its core component, the Centralised Bond Book-Entry System, is linked with the automated Interbank Trading System of the National Interbank Funding Center in order to support a *straight-through processing* (*zhitong chuli* 直通处理) of the trading and settlement layers of the interbank bond market. The main trading types are spot, *repo* (*huigou* 回购) and forward trades, the latter two having been introduced in the interbank bond market in 2004 and 2005 respectively. The following settlement principles are applied:

- *Same-day confirmation* (*tongri queren* 同日确认): Market participants have to confirm the details of the trade on the same day. If a trade is concluded via the Interbank Trading System, the CDC automatically receives the details of the trade and sends them to the counterparties for confirmation. If a trade is concluded outside the Interbank Trading System, one counterparty has to send the trade details to the CDC, which forwards them to the other counterparty for confirmation.

  After matching the settlement instructions of the two counterparties, a settlement contract is formed (*binding matching*), and the CDC proceeds with the settlement of the instructions.

- *Settlement cycle* (*jiesuan zhouqi* 结算周期): The CDC provides settlement services to the participants in the interbank bond market according to the rolling settlement principle. The settlement cycle is T+0 for DVP settlement, and T+1 for the other settlement methods (in case of special needs of the participants).

The *four settlement methods* used by the CDC are as follows:

- *Delivery versus payment* (DVP – *fukuan jiaoge* 付款交割, *quankuan duifu* 券款兑付 or *huoyin duifu* 货银对付): The movement of securities and the movement of funds are dependent on each other (delivery occurs only if payment occurs).

- *Payment after delivery* (PAD – *jianquan fukuan* 见券付款): The security buyer pays the funds only when he has "seen" (*jian* 见) the securities, i.e. when the securities movement has been completed.

- *Delivery after payment* (DAP – *jiankuan fuquan* 见款付券): The security seller delivers the securities only when he has "seen" (*jian*) the funds, i.e. when the funds movement has been completed.

- *Free of payment* (FOP – *chunquan guohu* 纯券过户): Securities are moved independently of or with no funds movement.

Today, *DVP*, which was introduced in 2004 (see Section 2.3 below), is *by far* the *dominant settlement method*. In 2008, the share of DVP settlement in total settlement in central bank money reached 95% in terms of value and 89% in terms of volume. As explained below, the CDC applies an interfaced DVP model.

SETTLEMENT RISK MITIGATION

DVP settlement and trade as well as settlement *matching* (*pipei* 匹配 or *peidui* 配对) are used as the main risk mitigation methods. Once matched, trades are binding on the participants. In addition, the feature of *auto-collateralisation* (*zidong zhiya rongzi* 自动质押融资) exists.

There are no buy-in/sell-out rules, and although securities lending and borrowing is planned for the future, the CDC has not yet implemented it. Short-selling is generally considered as being too risky; only market-makers in the interbank bond market are allowed to short-sell (since 2007).

2.3 THE INTRODUCTION OF DVP SETTLEMENT

To better understand the different levels of adoption of DVP settlement, which plays a majority role in the CDC, but only a minority role in the SD&C, it is worth looking at the history of the introduction of DVP settlement in China. This policy measure also reveals some elements that are characteristic of the Chinese reform path in general, namely experimentation and gradual implementation,[24] as well as internal and external justification. Further aspects of policy-making in China from the perspective of market infrastructure reform will be explored in Part 3.

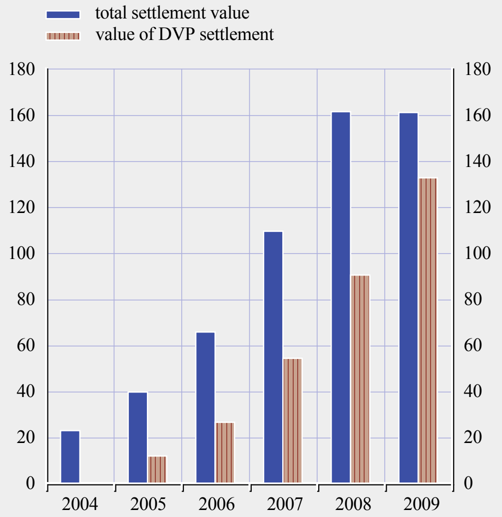
To enable DVP settlement in central bank money, in November 2004 the CDC linked its centralised bond business system with the RTGS (real-time gross settlement) system (HVPS) of the China National Clearing Center (CNCC; see Section 3.2.1 below), and started to provide DVP settlement for commercial banks. In the following three years, which can be regarded as the *experimentation* phase, both the total CDC settlement value and the value of DVP settlement rose sharply, as shown in Chart 3, increasing the DVP ratio to almost 50% in 2007.

Following an overall assessment and encouraged by the success of DVP, the PBC had already at the beginning of 2007 approved a scheme to extend DVP settlement to non-bank institutions, with the aim to "upgrade their settlement credit rating" and to further reduce settlement risk.[25] In August 2008, after establishing the necessary correspondent banking arrangements (see below), the CDC began to provide DVP settlement services also to non-bank institution members. Since then, DVP settlement has been applied to all types of participants in the interbank bond market, greatly increasing its post-trading safety and efficiency. According to the PBC, in 2009 the value of transactions settled by the CDC in DVP mode amounted to RMB 132.7 trillion (€13.8 trillion), which was equivalent to a DVP ratio of 82.4% in terms of value (see Chart 3).[26]

As far as the settlement accounts are concerned, the securities accounts are held on the CDC platform and the cash accounts are held in the RTGS system (HVPS), so the applied DVP model is an *interfaced model* (*jiekou moshi* 接口模式). To be able to participate in the DVP settlement, interbank bond market participants need to open bond custody accounts with the CDC and fund settlement accounts in the HVPS.

Chart 3 Development of CDC settlement value (including DVP) until 2009

(in RMB trillion)



Source: Zhongguo renmin yinhang zhifu jiesuan si (2010), figure 43, p. 57, based on CDC data.

Non-bank institutions, which are not eligible to open fund settlement accounts in the HVPS, need to entrust a commercial bank or the CDC to perform the funds movement on their behalf. To be able to act as a correspondent bank for a non-HVPS participant, the CDC opens a special fund settlement account in the HVPS, under which a sub-account will be opened for the non-HVPS participant.

There are three possible scenarios to achieve DVP settlement: DVP settlement between commercial banks (HVPS participants); DVP settlement involving non-bank institutions, which entrust a commercial bank to complete the funds transfer; and DVP settlement involving non-bank institutions, which entrust the CDC to complete the funds transfer. In all three scenarios, the basic

24 The Chinese image to describe this gradual approach is "crossing the river by feeling the stones" (*mozhe shitou guohe* 摸着石头过河).

25 Payment and Settlement Department of the People's Bank of China (PSD), *China Payment System Development Report 2007*, Beijing, March 2009, p. 69.

26 Zhongguo renmin yinhang zhifu jiesuan si 中国人民银行支付结算司 (Payment and Settlement Department of the People's Bank of China), *Zhongguo zhifu tixi fazhan baogao* 中国支付体系发展报告 (China Payment System Development Report) *2009*, May 2010, pp. 56-57.

settlement process is as follows: After receiving the settlement instructions from the trading counterparties, the CDC confirms whether the bond balance of the seller is sufficient. If that is the case, it blocks the corresponding bond amount and initiates a payment instruction to the HVPS. After confirmation from the HVPS that the funds transfer has been successful, the CDC completes the bond delivery immediately. The securities movement thus depends on the funds movement.

To ensure a smooth cooperation between the CDC and the CNCC in the provision of DVP settlement services, the two institutions have established a joint operational mechanism, which keeps operational responsibilities for the settlement system and the payment system separate, but requires that any measures, upgrades or updates of one system do not reduce the safety and stability of the other system. For coordination and communication purposes, the CDC and the CNCC have established a contact group.

Both in the revised version of the *Securities Law* that came into effect on 1 January 2006, and in the *Measures* (see Section 1.3.2 above), DVP is referred to as the "basic settlement principle" of securities markets in China. However, while it has been implemented in the interbank bond market, the stock exchange market still lags behind in the implementation of DVP.

Although so far the SD&C uses DVP only for a few products like ETFs and options, it has extensively studied DVP mechanisms in other countries (such as Hong Kong, Taiwan, Germany and the United States) and discussed the need to fully adopt DVP on the mainland. The conclusion is that China should do so, and the *justifications* given are both *internal and external*. Internally, it is mainly argued that "in case the funds on T+1 are not sufficient, the SD&C is facing a considerable amount of principal risk". Externally, DVP is justified for example with the G30/ISSA recommendations, and by calling it a "necessity of the internationalisation of markets" and a precondition for reaping the "benefits of globalisation".[27]

The experience already gained with DVP settlement by the SD&C is regarded as a first step towards fully achieving DVP in the stock exchange market. So the concept of *gradual implementation* is not only followed by the CDC, but also by the SD&C, which has already made preparations for the full adoption of DVP by analysing and collating the required system changes and the necessary updates to their rules, guidelines and other types of legal documentation. In April 2010 the CSRC approved new clearing and settlement rules, which will allow the SD&C to fully implement DVP, probably by the end of 2010. Although settlement still takes place in commercial bank money, the DVP ratio is expected to rise above 90%. In addition, the SD&C is discussing with the PBC the possibility of creating a link with the HVPS to enable DVP settlement in central bank money in the future.

The discrepancy to date between the levels of DVP implementation in the CDC and the SD&C might be linked to the fact that the PBC is in control of both the central bank accounts (via the CNCC) and the securities accounts (via the CDC), which are required to achieve DVP in central bank money, whereas the SD&C only controls the securities accounts. It could thus be argued that due to its operational role the PBC has an institutional advantage compared with the CSRC, which oversees the SD&C.

2.4 LINKAGES AND INTERNATIONAL COOPERATION

Domestically, a settlement link between the two CSDs has existed since 2004/2005 to enable the transfer of bonds across markets[28]. While at the beginning the link was completely manual, it was replaced in 2007 by an electronic link, which however still requires some manual

27 SD&C, *Woguo shixing DVP jiesuan zhidu de biyaoxing kexingxing fenxi* 我国实行DVP结算制度的必要性可行性分析 (Analysis of the necessity and feasiblity of practising DVP settlement in our country), undated paper, p. 4, see: http://www.chinaclear.cn/main/07/0701/070114/1225679479589.pdf.

28 The contractual basis is the *Service Agreement on Cross Market Custody Transfer of Treasury Bonds* between the CDC and the SD&C, which was renewed in March 2008. See SD&C, *Annual Report 2008*, p. 70.

intervention at the end of the day. The interbank bond market (CDC) and the exchange bond market (SD&C) have common participants with holdings of the same issue in both markets. This and the fact that the repo mechanisms[29] and rates of the two markets differ, which causes arbitrage, has caused a hot debate in the past on whether or not to create a fully integrated bond market. Although many advocate such an integration, it is unlikely to happen as long as the current regulatory structure – with the PBC being in charge of the interbank segment and the CSRC in charge of the exchange segment – remains unchanged. So the immediate future will probably only see the improvement of the CDC-SD&C link and potentially an additional trading link together with a harmonisation of market practices to accommodate the view of the State Council that the interbank bond market and the exchange bond market should be fully linked and connected with each other.

Internationally, the CDC has maintained electronic links with the Central Moneymarkets Unit (CMU)[30] of the Hong Kong Monetary Authority since 2004 for settlement in HKD, and with Clearstream Banking Luxembourg (CBL) since 2007 for settlement in USD and EUR. However, according to the CDC, up to now these links have not or almost not been used due to a lack of business.

Both the CDC and the SD&C have over the last couple of years signed memoranda of understanding (MoUs) with the major CSDs in the world, including JASDEC, DTCC, Clearstream and Euroclear, to foster information exchange and cooperation on issues or projects of common interest.

In terms of international standards, the two Chinese CSDs seem to be abreast of global developments. Examples include the adoption of ISIN codes[31] and efforts to introduce CUSIP codes by the SD&C, the scope of DVP settlement in the CDC, and the planned use of ISO 20022 for the next RTGS generation (HVPS; see Section 3.2.1 below).

As far as the PBC is concerned, it not only maintains relations with the major central banks in the world (including the European Central Bank), but also has been publishing since 2006 an annual *China Payment System Development Report* in Chinese and English, which is explicitly intended to "help increase the knowledge of the international community on the progress in payment system development"[32]. In July 2009 the PBC became an official member of the Committee on Payment and Settlement Systems (CPSS). It can be expected that this membership will deepen the internationalisation of the PBC in this field, as the CPSS is an important standard-setting body and international forum for payment and securities settlement systems. Another example of international cooperation is the IMF/World Bank Financial Sector Assessment Program (FSAP) for China,[33] which is planned for 2010 and will be coordinated, although also involving other ministries and government agencies, personally by ZHOU Xiaochuan 周小川, the Governor of the PBC.

29 For example, on the exchange bond market, the SD&C manages the collateral in a kind of tri-party repo, whereas such repos do not exist on the interbank bond market.
30 The CMU (www.cmu.org.hk) is a CSD for debt instruments and is operated by the Hong Kong Monetary Authority. The link between the CDC and the CMU is a one-way link so that CDC participants that are authorised to invest in foreign debt securities may settle and hold Hong Kong and foreign debt securities through the CDC account with the CMU.
31 5,134 financial instruments were assigned an ISIN by the end of October 2008, including A, B and H shares, Treasury bonds, corporate bonds, futures, warrants and indices. See SD&C, *Annual Report 2008*, p. 57.
32 PSD, *China Payment System Development Report 2006*, Beijing, September 2007, Foreword by Deputy Governor SU Ning.
33 In the concluding statement of his visit to Beijing on 17 November 2009, the IMF Managing Director Dominique Strauss-Kahn highlighted "China's commendable commitment to participate in the IMF's FSAP" and said that "joint work to undertake that assessment is already well underway": http://www.imf.org/external/np/sec/pr/2009/pr09411.htm, retrieved on 8 February 2010.

3 POLICY-MAKING IN THE FIELD OF MARKET INFRASTRUCTURES

3.1 IMPORTANCE AND OBJECTIVES

From a Chinese perspective, the policies and projects in the field of clearing and settlement are an important and integral part of the development of the payment system, which is understood as not only including "traditional banking payment and settlement, but also registration, custody, clearing and settlement of such financial market products as bonds, stocks and foreign exchange, as well as specialized clearing of bankcards".[34] Together with the payment system as a whole, securities clearing and settlement is regarded as being of *strategic importance* and therefore ranges relatively high on the reform agenda of the Chinese government. This can be seen from the intensity of the efforts in recent years (see Section 3.2.1 below), as well as from the attention and *support* payment system development receives *from political leaders at the highest level.* The visit by President HU Jintao 胡锦涛 to the Shanghai headquarters of China UnionPay on 16 January 2010 may serve as an example in this respect. During his visit, Hu Jintao was *inter alia* accompanied by Vice-Premier WANG Qishan 王岐山, the top economic policy-maker in charge of state finances and financial sector reforms, and PBC Governor Zhou Xiaochuan.[35] According to the PBC, the immediate objective of payment system development is to contribute to the "smooth transmission of monetary policy, financial stability and the improvement of financial services", with the "promotion of China's financial market reform as well as economic and social development" being the ultimate overall objective. The longer-term plans are both ambitious and confident, since the PBC aims at "developing the Chinese payment system into the most advanced, convenient and distinctive payment system in the world".[36]

3.2 THE ROLE OF THE CENTRAL BANK

The *Law of the People's Republic of China on the People's Bank of China,* promulgated in 1995 and revised in 2003, stipulates that one of the functions of the PBC is to "ensure the normal operation of payment and settlement systems" (Article 4). Furthermore, the PBC "shall formulate rules on payment and settlement together with the banking regulatory authority under the State Council [i.e. the CBRC]" (Article 27). The policy objectives of the PBC in the field of payment and settlement systems are safety and efficiency, as well as consumer protection and public confidence in the systems. The key tasks of the PBC in this field include the responsibility to:

- ensure the safe and efficient operation of systemically important payment systems;
- provide interbank payment, clearing and settlement services; and
- oversee payment and settlement systems, payment instruments, as well as payment institutions.

For the performance of its tasks, the PBC takes an operational role, carries out oversight activities and promotes payment and settlement system reform by acting as a catalyst. In the PBC terminology, these three roles are referred to as "organising (*zuzhi* 组织), overseeing (*jianguan* 监管) and driving (*tuidong* 推动) the payment system".

3.2.1 OPERATIONAL ROLE

In the field of securities market infrastructure, the PBC has no operational role, but acts, in cooperation with the CSRC, as an overseer of securities settlement systems and seeks to promote the establishment and improvement of clearing and settlement service networks.

34 PSD, *China Payment System Development Report 2008*, Beijing, October 2009, Preface by Mr OUYANG Weimin, first page.

35 For more information on the visit, see http://en.chinaunionpay.com/news/newsroom/file_6659614.html. Founded in March 2002, *China UnionPay* is an association for China's banking card industry, operating under the approval of the PBC.

36 See PSD, *China Payment System Development Report 2008*, Beijing, October 2009, p. 63.

In the field of payment systems, the PBC owns and operates, via its National Clearing Center (in Chinese *Qingsuan zongzhongxin* 清算总中心), the China National Advanced Payment System (CNAPS). The China National Clearing Center (CNCC) was established in May 1990 as a non-profit, separate organisation under the administration of the PBC, which builds, operates and maintains payment system infrastructure for the central bank. The CNCC is thus a kind of operational arm of the PBC similar to the New York Fed. The system architecture for CNAPS consists of a National Processing Center in Beijing with a local and a remote[37] backup center, as well as of 32 City Clearing Processing Centers spread all over the country.

The two main CNAPS components, the High Value Payment System (HVPS), which is an RTGS system, and the Bulk Electronic Payment System (BEPS), were launched in June 2005 and 2006 respectively. Other CNAPS components include the nationwide Cheque Image System (CIS), the China Domestic Foreign Currency Payment System (CDFCPS)[38] and the Electronic Commercial Draft System (ECDS), which went live in 2007, 2008 and 2009 respectively, the last one still being in a pilot phase. Overall, the CNAPS has almost 1,000 direct participants and more than 80,000 indirect participants. In 2009 the HVPS, which is crucial in the context of securities settlement (see Section 2.3 above), processed a daily average of 1,000,000 payments with a value of almost RMB 3 trillion (€312.5 billion). This can be compared with the Fedwire and TARGET2 systems, which processed 498,000 payments worth USD 2.5 trillion (€1.78 trillion) and 348,000 payments worth €2.1 trillion respectively on average per day in the second quarter of 2009.

This speed of implementation – not only has a major new system been rolled out once every year over the last five years, the PBC has since 2007 been planning the second-generation HVPS targeted to go live in 2010/2011 – is impressive, even if one considers that China started from a lower level, and proves that payment system development is taken very seriously by the PBC. According to the CNCC, the next-generation HVPS will include a centralised access point for commercial banks, more flexible liquidity management tools, a higher security and efficiency level, and the use of ISO 20022 messaging standards.

3.2.2 OVERSIGHT ROLE

The PBC formulated its oversight concept for the first time publicly in its *Payment System Development Report 2006* as the "action taken by the central bank to supervise and regulate the payment system, payment instruments and payment institutions through a mix of economic, legal and administrative measures in order to safeguard the safety and stability of the payment system and public trust in such system".[39] As mentioned above, *payment system* is understood in the broad sense of including securities clearing and settlement arrangements, and in 2007 the PBC assessed for the first time the CDC against the CPSS-IOSCO recommendations, concluding that "some indicators attained or even exceeded the recommendations and ranked among the top levels worldwide, while others kept a great distance from the recommendations".[40] Shortcomings mainly concerned Recommendations 5 (securities lending), 7 (DVP scope) and 9 (risk controls) and partly resulted in concrete measures, like the further expansion of DVP settlement (see Section 2.3 above) and the planned introduction of net settlement in the CDC (see Section 2.2.2 above). These examples show that the oversight and catalyst roles partly overlap and that activities under the former role may result in innovations intended under the latter role.

37 According to the CNCC, the non-local disaster recovery center is more than 1,000 kms away.

38 Since its launch in 2008, the PBC has established a cooperative oversight mechanism for the CDFCPS with the concerned central banks (including the European Central Bank for the euro), which foresees regular information-sharing.

39 PSD, *China Payment System Development Report 2006*, p. 3.

40 PSD, *China Payment System Development Report 2007*, p. 94.

3.2.3 CATALYST ROLE

Apart from operating and overseeing the payment system, the third role of the PBC is to promote innovation, or as it is sometimes euphemistically put, to "encourage innovation" (*cujin chuangxin* 促进创新) within the payment system. Two prominent examples that this encouragement might go as far as *institution-building* are China UnionPay (CUP) and the recently established Shanghai Clearing House (SCH).

They also reveal a tendency in PBC policy-making, namely that of putting PBC managers in charge of key infrastructures.[41] The first, China UnionPay (*Zhongguo yinlian* 中国银联), which has been instrumental in establishing the CUP card both domestically and internationally,[42] has since its foundation in 2002 been strongly promoted by the PBC, and its President is the former Director General of the Payment and Settlement Department of the PBC (PSD), Mr XU Luode 许罗德. The second, the Shanghai Clearing House (*Shanghai qingsuansuo* 上海清算所), which was founded on 28 November 2009 with the approval of the MOF and the PBC, will be headed by the former Deputy Director General of the PSD, Mr XU Zhen 许臻, as Chairman and General Manager. Although it has not yet started operations and its exact business scope is yet to be defined, it is likely that the SCH will serve the interbank foreign exchange market and the interbank bond market regulated by the PBC. This is suggested by its official name "Interbank Market Clearing House Corporation", and the fact that, according to a PBC press release, two of its four shareholders are the Shanghai-based China Foreign Exchange Trade System (CFETS) and the CDC.[43] The opening ceremony of the SCH was hosted by Mr SU Ning 苏宁, the PBC Deputy Governor in charge of payment and settlement issues, and attended by Governor Zhou Xiaochuan and Shanghai Mayor HAN Zheng 韩正, who both delivered speeches. The presence of its two highest policy-makers in the field of clearing and settlement (Zhou and Su) is a clear sign of the promotion of the SCH by the PBC.

3.3 CENTRAL AND LOCAL INTERESTS

The statements and references in the interventions of Governor Zhou and Mayor Han at the SCH opening ceremony offer some insight into the *consensus-building between central and local interests*, which according to the political scientists Lieberthal and Oksenberg is "central to the policy process" in China.[44]

In his speech, the Shanghai Mayor stressed that "setting up the Shanghai Clearing House is an important step taken to implement Document No. 19 of the State Council", which was issued on 14 April 2009 to promote the establishment of Shanghai as an international financial center and shipping hub.[45] It is worth consulting this reference, since Document No. 19 lays out the objective to "basically establish by 2020 an international financial center commensurate with the strength of the Chinese economy and the international status of the Renminbi, and a multi-layered financial market system, in which domestic and foreign investors participate together, which is internationalized to a relatively high degree and which completely provides for trading, price-setting and information functions". Concrete measures to achieve this goal include "the further improvement of unified and efficient modern

41 Another example is the SD&C: Both its current Chairman Mr CHEN Yaoxian 陈耀先 and General Manager Ms JIN Ying 金颖 have PBC backgrounds, although they also served the CSRC.

42 In terms of transaction volume, the CUP card is bigger than JCB, but behind VISA and MasterCard. By November 2009, CUP cards were accepted in 84 countries and regions. See http://en.chinaunionpay.com/comInstr/aboutUs/file_2649016.html, retrieved on 6 February 2010.

43 See http://www.pbc.gov.cn/english//detail.asp?col=6400&ID=1448, retrieved on 6 February 2010.

44 Cf. Kenneth Lieberthal and Michel Oksenberg, *Policy Making in China: Leaders, Structures and Processes*, Princeton University Press, Princeton, 1988, pp. 23-24.

45 State Council, *Guowuyuan guanyu tuijin Shanghai jiakuai fazhan xiandai fuwuye he xianjin zhizaoye jianshe guoji jinrong zhongxin he guoji hangyun zhongzin de yijian* 国务院关于推进上海加快发展现代服务业和先进制造业建设国际金融中心和国际航运中心的意见 (Opinions of the State Council on promoting the rapid development of modern service industry and advanced manufacturing industry in Shanghai and making it an international financial and shipping center), State Council Document No. 19, April 2009. See: http://www.gov.cn/gongbao/content/2009/content_1303637.htm, retrieved on 4 February 2010.

financial support systems, such as those of registration, custody, clearing and settlement", as Han Zheng recalled in his speech.

While Governor Zhou put the SCH in his speech more in the context of macro regulation and risk management, in particular after the outbreak of the financial crisis, he did not fail to also mention the local objective of promoting Shanghai as a financial center: "Setting up a specialized and independent clearing house is a major step taken by the PBC to implement instructions of the central government, tackle the impact of the international financial crisis, deepen financial market reform, strengthen financial infrastructure building and promote the construction of Shanghai as an international financial center".[46]

So despite the different emphasis in their speeches and differing underlying motivations, the prevailing consensus between the central level represented by Governor Zhou and the local level represented by Mayor Han becomes apparent. Without this general consensus, the decision to set up the SCH would not have been made, or only at a later stage after further bargaining between local and central levels.

3.4 ORGANISATIONAL ASPECTS

The main institutions involved in market infrastructure-related policy-making are the PBC and the CSRC.

As far as the PBC is concerned, the main actor responsible for policy formulation and implementation is the Payment and Settlement Department (PSD) headed by Director General OUYANG Weimin 欧阳卫民 (see Picture 1).

As mentioned above, the PSD falls under the portfolio of Deputy Governor Su Ning (see Picture 2).

Although the PSD comprises six Divisions (General Affairs, Settlement Instrument Management, Payment System Management,

46 The PBC press release of 28 November 2009 (see footnote 43) cites from the speeches of Mayor Han and Governor Zhou.

Picture 1 Director General OUYANG Weimin during an online chat on bank cards, 2 July 2009

Source: PBC (see http://www.pbc.gov.cn/detail.asp?col=100&ID=3283, retrieved on 12 February 2010).

Picture 2 PBC Deputy Governor SU Ning visiting the CNCC on 31 December 2009

Source: PBC (see http://www.pbc.gov.cn/detail.asp?col=100&ID=3475, retrieved on 12 February 2010).

Accounting System, Risk Oversight, and Information Analysis) and a Research Office, as at November 2009 its total headcount only amounted to 32 permanent full-time-equivalent (FTE) staff members, plus 8 FTE temporary staff from regional offices. On the one hand, with only 40 people the PSD seems quite efficient, considering the multitude of issues under its responsibility and the respective headcount at comparable institutions (Federal Reserve, European Central Bank). On the other hand, it should not be forgotten that the CNCC (see Section 3.2.1 above) implements all operational policies and projects for the PBC, with the latter producing for example the high-level user requirements for a system and the former designing and building it. In November 2009, the CNCC had around 200 permanent FTEs, plus 150-200 staff/consultants with short-term contracts. The total staff of its 32 local Clearing Processing Centers currently amounts to another 200-300 FTEs.

The CDC is regulated by the Financial Market Department (FMD; see Section 1.3.1 above) of the PBC, which comprises seven Divisions (General Affairs, Bond Issuance, Bond Trading, Interbank Lending Market, Gold and Foreign Exchange Markets, Real Estate Financing, and Credit Policy Administration). The FMD is headed by Mr XIE Duo 谢多. In June 2010, its headcount amounted to 28 permanent FTEs, plus 10-12 FTE temporary staff from regional offices.

As far as the CSRC is concerned, the main actor responsible for policy formulation and implementation is the Market Supervision Department, which is also in charge of regulating the SD&C. It is headed by Mr XIE Geng 谢庚 and consists of five Divisions (General Affairs, Trading Supervision, Settlement Supervision, Statistical Analysis, and Market Oversight) with a total headcount of 21 permanent FTEs in February 2010.

4 CONCLUSION AND OUTLOOK

Despite their remaining segmentation and access restrictions, Chinese securities markets have become more and more sophisticated and important for the economy over the last twenty years. This development is likely to continue in the future, and could even further accelerate if securities markets were to become completely integrated and open. However, for this to happen, an integrated regulatory structure replacing the currently split responsibilities of the PBC and the CSRC would probably be required as well.

Another important boost for the Chinese market to continue its growth and to gain global importance would be if Beijing were to introduce full capital account convertibility. It is hard to predict when exactly the RMB will become fully convertible, but some experts[47] believe that it could happen in the second half of the decade (2015-2020). This coincides with the above-mentioned aim stated in State Council Document No. 19 to transform Shanghai by 2020 into an international financial center, which is "commensurate with the strength of the Chinese economy and the international status of the Renminbi".

The post-trading infrastructure in China, which is predominantly a direct holding country, consists of two CSDs, the SD&C and the CDC. They are regulated by the CSRC and the PBC and serve the stock exchange market and the interbank bond market respectively. The SD&C also acts as a CCP, whereas a separate institution, the Shanghai Clearing House, has just been set up, which will probably act as a CCP for the interbank bond market.

In the light of the available information, the Chinese post-trading process can be regarded as technically safe and efficient. The generalisation of DVP settlement currently under way will complete its modernisation. Once DVP is completely introduced in the stock exchange market, the inherent risks of its current method of settling securities on T+0 and cash on T+1 will be eliminated, and the settlement reserve fund, which binds a lot of liquidity of the SD&C participants, will no longer be necessary.

The CSRC and the PBC are the key policy-makers in the post-trading area with investor protection, safety and efficiency being the main policy objectives. The policy framework and the policy-making process seem to be effective, whether it be in the area of operating, regulating or developing the market infrastructure. Of the two institutions, the leverage of the PBC seems to surpass that of the CSRC due to the operational role of the former, which may explain the different extent of DVP implementation in the interbank bond market and the stock exchange market.

The huge efforts and leadership attention in the field of market infrastructure development in general indicate a high degree of consensus on its importance and the existence of a longer-term strategy behind it. Comparing the payment and settlement system landscape today with the situation 5-6 years ago, and considering success stories like the CUP card, which managed to enter the league of VISA, MasterCard and JCB, and the CNCC (the operational arm of the PBC), the efficiency and effectiveness of policy implementation in this field becomes apparent.

Therefore,

- looking at what has already been achieved in the field of payment and settlement system development in China,

47 Including Antony Leung, the former Financial Secretary of Hong Kong (see http://www.chinastakes.com/2009/4/rmb-convertibility-expected-when-shanghai-becomes-a-global-financial-center-as-approved-by-the-state-council.html, retrieved on 22 June 2010). See also Friedrich Wu, Rongfang Pan, and Di Wang, "Renminbi's potential to become a global currency", *China & World Economy*, Vol. 18, No. 1, January-February 2010, pp. 63-81, who review some of the literature on this topic. For a broader treatment of Chinese capital account convertibility issues see Lorenzo Cappiello and Gianluigi Ferrucci, "The sustainability of China's exchange rate policy and capital account liberalisation", ECB Occasional Paper No 82, March 2008.

- remembering the growth potential of its securities markets, in particular if the government in Beijing opens them completely and moves to full capital account convertibility, and

- taking into account the effectiveness of the policy process, which is not only visible in market infrastructure development, but also in the Chinese policy response to the crisis,

it can be concluded that Chinese policy-makers are well positioned to reach their goal of providing the domestic capital markets with advanced and efficient operational support systems, especially those of clearing and settlement. This will include the envisaged aim of generalising DVP settlement. And it can be expected that globally the importance of securities transactions originating from or being processed in China will increase, as will the foreign interest in and knowledge of Chinese securities infrastructures and their characteristics.

Finally, the findings of this study suggest that over the next ten years or so the Chinese mainland market is likely to become much more integrated with other major securities markets in Asia, Europe and the US, with cross-border linkages expanding, business volumes growing and standards, as well as market practices, converging more and more.

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