VOLUME 2

Sub-Forum 2- Information on Transaction Flows and Settlement Infrastructures

Overview of Sub-Forum 2

Statement from SF2 Chairs

The Chair and Vice-chairs express their heartfelt gratitude to members and experts of the ABMF SF2 for their contributions to make this initiative fruitful. The Chair and Vice-chairs also hope to have the continuous support of the members and experts for this initiative since this report is only the first step to bring to fruition the objectives of ABMF. Last but not least, the Chair and Vice-chairs are grateful to the ADB secretariat and the SF2 team, particularly the ADB consultant for SF2, for drafting this report.

February 2012

Mr. Jong-Hyung Lee
Chair of the ABMF SF2

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Preface

The Association of Southeast Asian Nations plus People's Republic of China, Japan, and Republic of Korea (ASEAN+3) established a forum called ASEAN+3 Bond Market Forum (ABMF) in September 2010 as a common platform to foster standardization of market practices and harmonization of regulations relating to cross-border trades in the region. ABMF reports its activities to the Task Force 3 (TF3) of the Asian Bond Markets Initiative (ABMI) under the institutional framework of the ASEAN+3 Finance Ministers Meeting. ABMF consists of two sub-forums—Sub-Forum 1 (SF1) and Sub-Forum 2 (SF2). SF1 collates and compares regulations and market practices in the region, while SF2 looks to harmonize transaction procedures and bond messages with a view to cut the costs of cross-border deals. This report focuses on the activities of SF2.

Members and experts participating in the ABMF SF2 have conducted a survey on bond markets and their infrastructures in ASEAN+3 with tremendous support from the Asian Development Bank (ADB) secretariat and consultants. The survey looked into making possible cross-border straight-through processing of bond transactions to encourage investment of ASEAN+3 monies in the region. The participants have contributed through fruitful discussions and compiled this report to be submitted to the Task Force 3 (TF3) of ABMI.

There are 13 countries and 14 economies in the ASEAN+3 including Brunei Darussalam (Brunei, BRU), the Kingdom of Cambodia (Cambodia, CAM), People's Republic of China (China, PRC), Hong Kong Special Administrative Region (Hong Kong, HKG), Republic of Indonesia (Indonesia, INO), Japan (Japan, JPN), Republic of Korea (Korea, KOR), Lao People's Democratic Republic (Lao PDR, LAO), Malaysia (Malaysia, MAL), Union of Myanmar (Myanmar, MYA), Republic of the Philippines (Philippines, PHI), Republic of Singapore (Singapore, SIN), Kingdom of Thailand (Thailand, THA), and Social Republic of Viet Nam (Viet Nam, VIE).

Ten economies out of 14 have already developed sound and robust bond markets, while four economies are planning to or are in the process of developing their markets. This report mainly discusses the harmonization and standardization of the 10 economies

with existing bond markets. Other important issues of ABMF SF2 include planning, developing and fostering the bond markets of the four economies, which are creating sound and robust bond markets in their respective countries.

This report is a preliminary result of the ABMF SF2 and consists of three parts. Part 1 provides an overview of the bond markets and their infrastructures in ASEAN+3. Part 2 reports on the issues of economies with bond markets in the region. Part 3 contains the bond-market infrastructure diagrams, domestic bond transaction flows, and cross-border bond transaction flows. Contents of the report are as follows:

Overview of Sub-Forum 2

Part 1: Bond Markets and Their Infrastructure in ASEAN+3

Part 2: Bond Markets and Their Infrastructures in Each Economy

Part 3: Bond Market Infrastructure Diagrams, Domestic Bond Transaction Flows, and Cross-border Bond Transaction Flows

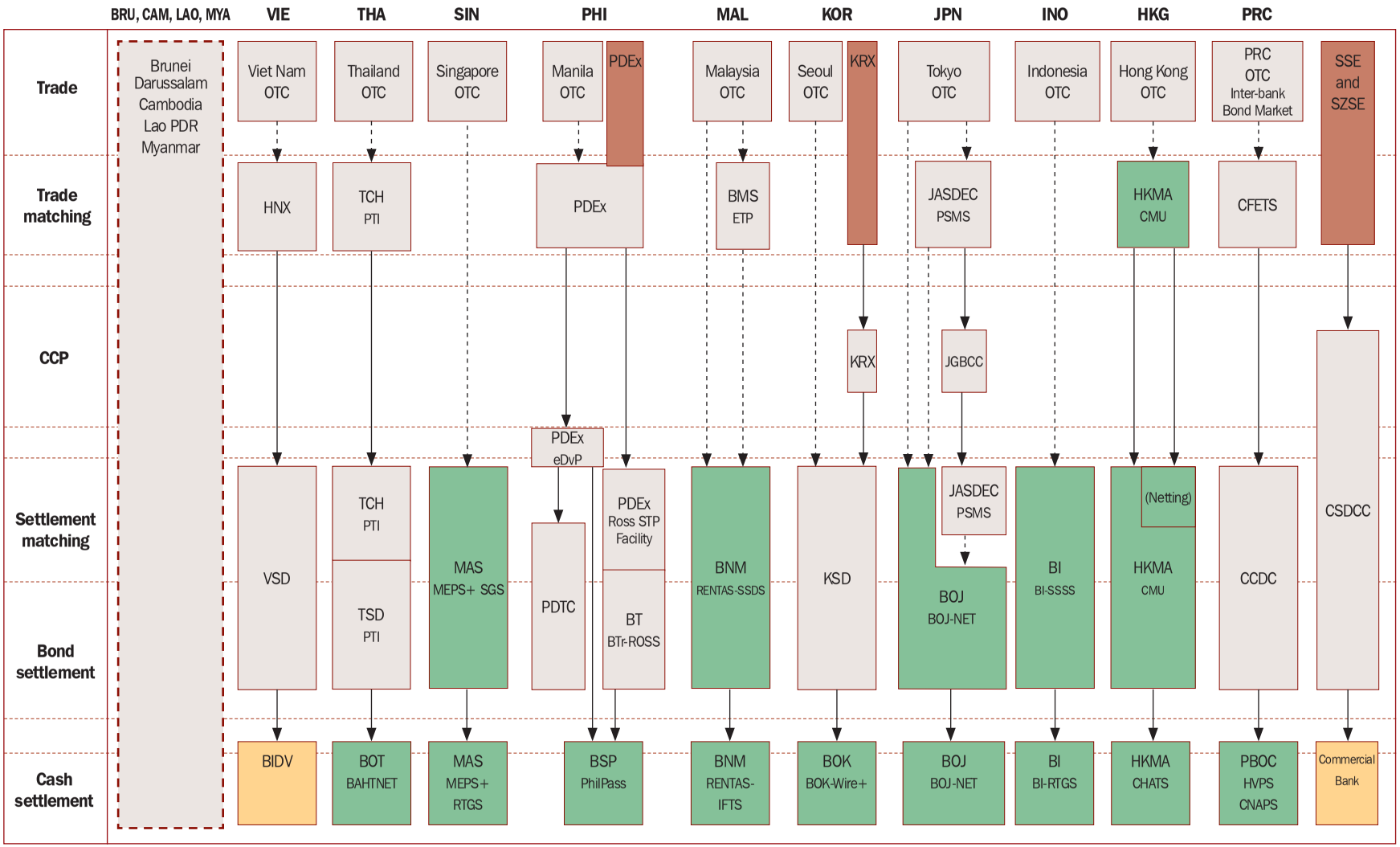
Executive Summary of SF2

The Joint Ministerial Statement of the 13th Association of Southeast Asian Nations, the People's Republic of China, Japan, and the Republic of Korea (ASEAN+3) Finance Ministers' Meeting, which was held on 2 May 2010 in Tashkent, Uzbekistan, endorsed the establishment of the ASEAN+3 Bond Market Forum (ABMF) as a common platform to foster standardization of market practices and harmonization of regulations relating to cross-border bond transactions in the region. The ABMF aims to discuss various bond market issues in order to enhance the mobilization of regional savings for regional investments and to improve information flow in the markets. The ABMF consists of two forums: Sub-Forum 1 (SF1) and Sub-Forum 2 (SF2). The objective of SF1 is to close the information gap in regulations, market practices, and other areas in the region's bond markets. SF2 focuses to enhance regional straight-through processing (STP) by harmonization of transaction procedures and standardization of messages. This paper is the report about the activities of SF2 from September 2010 to December 2011.

The ABMF SF2 members and experts (ABMF SF2) discussed how to enhance regional STP of government bond transactions from trade to settlement, and conducted a survey on government bond settlement-related infrastructures, domestic bond transaction flows, and cross-border bond transaction flows. The ABMF SF2 chose delivery versus payment (DVP) as a typical transaction type to be surveyed.

Below is an overview of government bond markets in ASEAN+3.

ASEAN+3 Government Bond Market Infrastructure Diagram



Note: Exchange Market; Central Bank; Commercial Bank
Direct intersystem connection
Indirect connection. Trade data (bond settlement instructions) are entered to CSD by agent custodians.

Source: ABMF SF2.

The ABMF SF2 also surveyed on matching, settlement cycle, and other issues including numbering and coding such as international securities identification number (ISIN), business identifier code (BIC), securities account number, and character code.

The ABMF SF2 compiled and discussed the survey results from the viewpoint of enhancing cross-border STP and standardization of the messages, including numbering and coding.

The following are preliminary **conclusions** of the discussions:

1. **Robust and sound bond infrastructures.** Each market in ASEAN+3 has its own robust and sound infrastructures. Operational risks associated with the systems are comparable with those of developed markets. Each market in ASEAN+3 has its own robust and sound infrastructures.

2. **Listed at exchanges and traded in over-the-counter (OTC) markets.** Bonds are listed at stock exchanges in many markets; however, these are mostly traded over the phone or through other communication tools by negotiation among brokers and dealers. Bond markets in the region are generally OTC markets. This is common elsewhere since bond trade is mainly quote-driven where brokers and dealers need to negotiate the price. In contrast, exchange trade is order-driven where all orders of buyers and sellers can be seen and matched by systems.

3. **Connection between trade system and central securities depository (CSD).** In some markets in ASEAN+3, trade data are directly transmitted to CSD from the trade system to be used for bond settlement, which is efficient and effective from an STP perspective. In order to enhance STP in the region, each market is expected to automate and connect systems between trade system and book-entry system of the CSD.

4. **Cross-border STP.** There are still comparatively few cross-border bond transactions. Almost all trade data are entered in the CSD within the borders of markets. Both trade and book-entry systems are expected to be connected multilaterally to enhance cross-border bond transactions.

5. **Cross-border DVP.** In order to enhance cross-border STP in ASEAN+3, increasing liquidity of government bonds and currencies in the region is essential. From this perspective, ABMF SF2 members and experts are expected to further discuss fit-and-gap analysis of cross-border DVP transactions.

6. **Matching.** All markets have a matching at a trade or settlement level, and even at both levels. Some markets adopted central matching and others local matching. In some markets, both central matching and local matching are used. Also, matching with additional features such as reduction of input workloads is implemented. Functions such as input of post-dated transaction for bond settlement book-entry systems and automated pre-settlement matching systems are expected to be implemented since manual pre-matching through facsimile and/or telephone in the region remains to be the mode of matching.

7. **Settlement cycle.** Settlement cycles for local bond transactions in many markets are already realized at trade date + 1 (T+1), but market practices of cross-border bond transactions depend on each market player which seem to be more than T+2 and negotiable. As such, there is no standard settlement cycle in ASEAN+3. A settlement cycle, which is a rule for all market participants to observe, is expected, though not stipulated in regulation or law.

8. **Harmonization of terminologies and definitions.** Terminologies need to be standardized before harmonizing systems and messaging in the region.

9. **Institutional Framework.** Fostering a mutual relationship among market actors and stakeholders is important to implement a cross-border bond trade and settlement facility. To this end, there is a need to establish an institutional framework involving authorities and experts in the fields of policy, payment, information technology, and business operations to facilitate efficient communication, especially in emergencies such as [system] failures and disasters.

10. **Reporting facility.** Most markets in ASEAN+3 are developing and improving the reporting facility of trade data to authorities including self-regulatory organizations (SROs). A data collection scheme will be very important for the entire ASEAN+3 to make markets more sound and transparent. Also, this kind of initiative may be coordinated with the activities of the ASEAN+3 Macro-economic Research Office (AMRO).

11. **Monitoring new issues.** New issues such as new technologies and new standards including Legal Entity Identifier will be monitored to understand market trends and possible breakthrough practices.

Based on these conclusions, possible activities of the next phase of ABMF SF2, as agreed, are listed below.

1. Continuing survey of bond transaction flows, messaging, and market practices;
2. Conduct ISO 20022 fit-and-gap analysis for government bond DVP transaction;
3. Propose a possible roadmap to standardize and harmonize bond markets in ASEAN+3;
4. Prepare detailed government bond transaction flows of economies that can possibly be connected bilaterally; and
5. Provide technical assistance to economies planning to develop bond markets in ASEAN+3.

Member List of SF2

A. National Members and Experts

Economy	Membership	Institution
Brunei Darussalam	National Member	Monetary Authority of Brunei Darussalam
Cambodia	National Member	Securities and Exchange Commission of Cambodia
China, People's Rep. of	National Member	People's Bank of China
China, People's Rep. of	National Member	China Security Regulatory Commission
China, People's Rep. of	National Expert	China Securities Depository and Clearing Corporation Limited
China, People's Rep. of	National Expert	China Central Depository and Clearing Co., Ltd. (CCDC)
China, People's Rep. of	National Expert	Shanghai Clearing House (SHCH)
China, People's Rep. of	National Expert	China Foreign Exchange Trade System (CFETS)/National Interbank Funding Center (NIFC)
Hong Kong, China	National Member	Hong Kong Monetary Authority
Indonesia	National Member	Ministry of Finance
Indonesia	National Member	Indonesian Capital Market and Financial Institutions Supervisory Agency (Bapepam-LK)
Indonesia	National Member	PT Kustodian Sentral Efek Indonesia (KSEI)/ Indonesian Central Securities Depository
Indonesia	National Member	Indonesia Stock Exchange (IDX)
Japan	National Member	Japan Securities Depository Center, Inc. (JASDEC)
Japan	National Expert	Mizuho Corporate Bank, Ltd.
Korea, Rep. of	National Member	Korea Securities Depository (KSD)
Korea, Rep. of	National Expert	Korea Capital Market Institute (KCMI)
Lao PDR	National Member	Ministry of Finance
Lao PDR	National Member	Securities and Exchange Commission Office, Bank of Lao PDR
Myanmar	National Member	Central Bank of Myanmar
Philippines	National Member	Philippine Dealing System Holdings Corp (PDS Group)
Philippines	National Member	Bankers Association of the Philippines (BAP)
Thailand	National Member	The Stock Exchange of Thailand (SET)
Viet Nam	National Member	Vietnam Securities Depository (VSD)
Viet Nam	National Member	Hanoi Stock Exchange

B. International Experts

Institution	Name	Position
Citibank	Rudy Ingkiriwang	Director, Regional Network Management, Global Transaction Services
Deutsche Bank AG	Celia D. Orbeta	Direct Securities Services, Global Transaction Banking
HSBC Securities Services	Patrick Edmond Cichy	Senior Business Consultant
J.P. Morgan	Masayuki Tagai	Executive Director, Global Market Infrastructures
State Street Bank and Trust	Jonathan Rodda	(1) Director, Securities Market Practice Group (2) Vice President, State Street Bank and Trust Company
State Street Global Advisors	Hon Cheung	Regional Director - Asia, Official Institutions Group
SWIFT	Adam Wilson	Director, Securities Markets, Asia Pacific
	Alexandre Kech	Securities Standards Development
The Bank of Tokyo Mitsubishi UFJ Ltd	Taketoshi Mori	(1) Director, Securities Market Practice Group (2) Head of Securities Market Infrastructure

C. Observing Authorities

Economy	Institution	Economy	Institution
Cambodia	Ministry of Economy and Finance	Malaysia	Securities Commission Malaysia
Cambodia	National Bank of Cambodia	Philippines	Department of Finance
China, People's Rep. of	Ministry of Finance	Philippines	Bangko Sentral ng Pilipinas
Indonesia	Bank Indonesia	Singapore	Ministry of Finance
Japan	Ministry of Finance	Singapore	Monetary Authority of Singapore
Japan	Bank of Japan	Thailand	Ministry of Finance
Korea, Rep. of	Ministry of Strategy and Finance	Thailand	Bank of Thailand
Korea, Rep. of	Bank of Korea	Viet Nam	Ministry of Finance of Viet Nam
Malaysia	Bank Negara Malaysia	Viet Nam	State Bank of Viet Nam

D. ADB Secretariat and Consultants

Institution	Name	Position
ADB Secretariat	Satoru Yamadera	Economist, Office of Regional Economic Integration (–Sept. 2011) (currently Bank of Japan)
	Seung Jae Lee	Principal Financial Sector Specialist (June 2011–)
	Shinji Kawai	Senior Financial Sector Specialist (Banking) (Sept. 2011–)
ADB Consultant for SF1	Shigehito Inukai	Professor, Faculty of Law, Waseda University
ADB Consultant for SF2	Taiji Inui	Senior Manager, NTT DATA Corporation
ADB Consultant	Matthias Schmidt	Custody Business Specialist

Part 1
Bond Markets and Their Infrastructures in ASEAN+3

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1. Introduction

1.1 Purpose of the ASEAN+3 Bond Market Forum

The ASEAN+3 Bond Market Forum (ABMF) was established in September 2010 based on the endorsement of the ASEAN+3 Finance Ministers' Meeting[1] as a common platform to foster standardization of market practices and harmonization of regulations relating to cross-border bond transaction in the region.

The ABMF is expected to discuss various bond market issues to further develop liquid and well-functioning bond markets to make cross-border bond investment and settlement both smoother and cheaper; hence, the region's abundant savings are channeled more effectively into the region's increasing investment needs.

The ABMF aims to: (i) assess the existing regulatory frameworks and identify recommendations on how to foster harmonization of regulations and market practices that facilitate cross-border bond transactions in the region; (ii) enhance dialogue between the private sector and ASEAN+3 officials to develop bond markets in the region and promote harmonization, standardization, and integration; and (iii) provide opportunities to exchange knowledge, expertise, and experience between the private and public sectors in the region.

The ABMF takes stock of the Group of Experts (GoE) report, which recommends improving information flows to foreign investors to narrow the information gap by facilitating access to information on regulations.[2] The GoE also proposes to start discussions on the settlement barriers among private sector experts.

1.2 Organizational Structure and Governance

The ABMF is organized under Task Force 3 (TF3) of the Asian Bond Markets Initiative (ABMI). The ABMF consults with the co-chairs of TF3 occasionally in undertaking any regional activities, and reports to TF3 on a regular basis regarding the progress of its activities. The organizational structure of ABMF is shown as follows.

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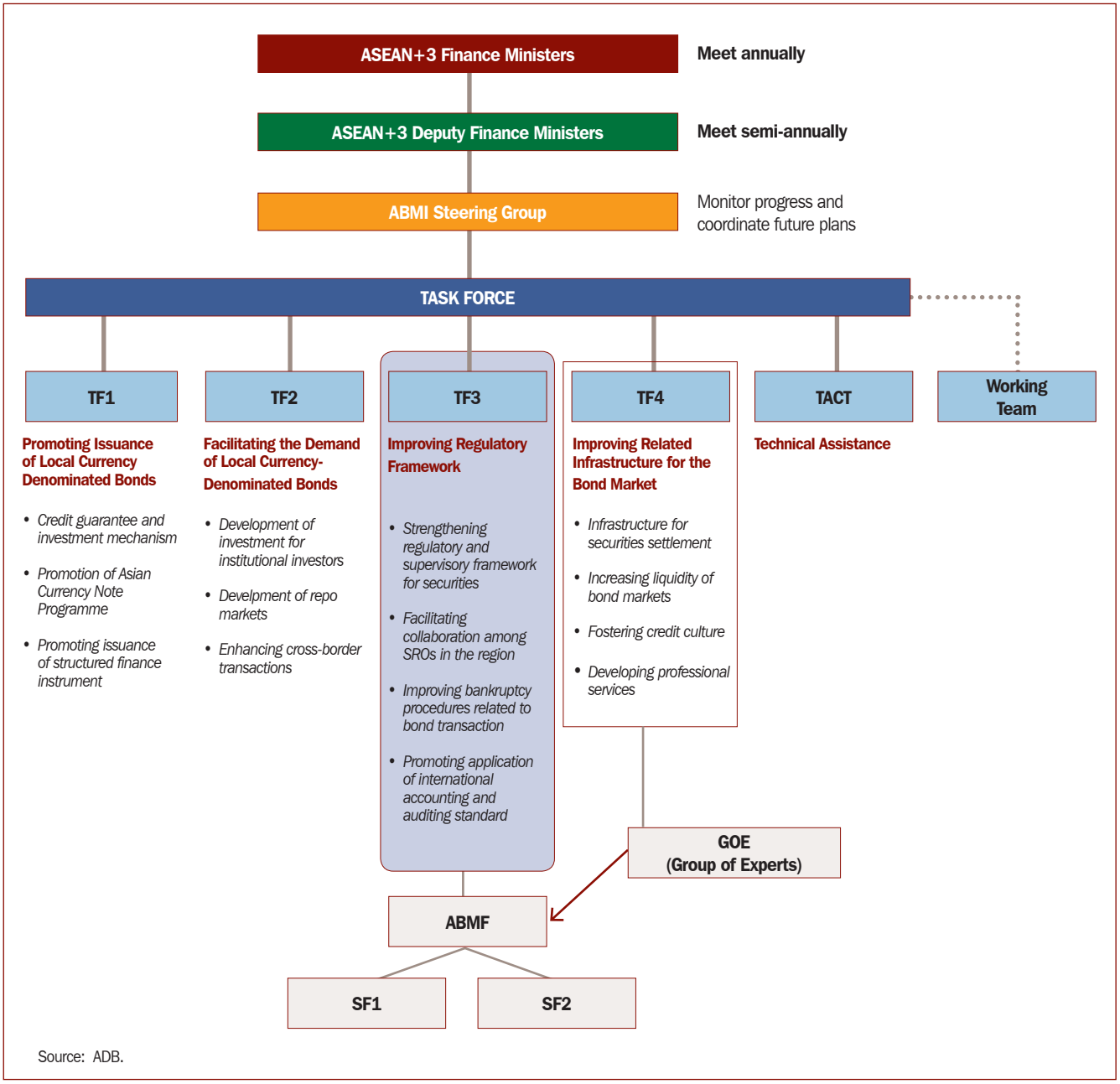
1 The Joint Ministerial Statement of the 13th ASEAN+3 Finance Ministers' Meeting, 2 May 2010, Tashkent, Uzbekistan states that: "We [ASEAN+3 Finance Ministers] took note of the Group of Experts' findings and suggestions on facilitating cross-border bond transactions and settlement, and welcomed the establishment of the technical working group on Regional Settlement Intermediary (RSI) to further evaluate the policy recommendations. We endorsed the establishment of ASEAN+3 Bond Market Forum (ABMF) as a common platform to foster standardization of market practices and harmonization of regulations relating to cross-border bond transactions in the region."

2 ASEAN+3 Asian Bond Markets Initiatives (ABMI) Task Force 4–Group of Experts. http://asean3goe.adb.org

Figure 1.1 Organizational Structure of the ASEAN+3 Bond Market Forum



Source: ADB.

The ABMF consists of two sub-forums: Sub-Forum 1 (SF1) and Sub-Forum 2 (SF2). The objective of SF1 is to close the information gap in regulations, market practices and other areas in the region's bond markets. SF2 focuses on enhancing straight through processing (STP) in ASEAN+3. This report is about SF2.

1.3 ASEAN+3 Bond Market Forum Sub-Forum 2

The GoE report identified various settlement barriers related to messaging formats, securities numbering, matching, and settlement cycle. Thus, the ABMF SF2 addresses these problems to enhance regional STP by harmonization of transaction procedures and standardization of messages.

It is desirable to execute cross-border transaction without any manual processes or data conversion among market infrastructures in the region. This ideal situation can be realized if all transactions are operated through a system using common standards and consistent messaging. This is not currently possible because individual countries have their own practices and standards, which is inevitable because certain transaction procedures follow national requirements to account for unique circumstances. In addition, some segments of a market may prefer ways of handling transactions, which creates differences in transaction procedures, hence, requiring additional conversion to international practices. Furthermore, differences in language remain a significant barrier as some ASEAN+3 countries use their own characters for payment systems and communication. Adopting international standards frameworks such as ISO20022 can mitigate impediments and barriers, which will enhance interoperability in ASEAN+3 bond markets.[3]

ABMF SF2 has mainly discussed business flows by focusing on government bond transactions, which are larger and relatively simpler compared to corporate bond transactions. Then, the discussion can be elevated to include corporate bonds, which often involve various corporate actions and other complex procedures. Transaction procedures of securities can be divided into five categories: issuances, investor registration, trades and settlements, interest payments, and redemptions. The sub-forum mainly identifies and standardizes the procedures in trades and settlements, particularly Delivery versus Payment (DVP) of government bonds. In addition, the ABMF SF2 discusses other settlement-related barriers such as securities numbering, settlement cycles, and matching to improve settlement procedures.

1.4 Membership and Participants

The ABMF consists of (i) national members, (ii) national experts, and (iii) international experts. Members and experts were selected based on issues adopted by TF3, and must have extensive knowledge of and expertise in the relevant issues. Members and experts were selected from among those actively involved in bond markets in the region including, but not limited to:

(i) financial industry associations such as bankers' associations, securities dealers' associations, and self-regulatory organizations (SROs);
(ii) institutional investors such as pension services, fund managers, and insurance companies;
(iii) commercial banks and brokers;
(iv) custodians and central securities depositories (CSDs);
(v) rating agencies;
(vi) financial services providers, including information technology vendors;
(vii) financial regulators, including securities commissions;
(viii) central banks;
(ix) law firms; and
(x) academics.

[3] The International Standard Organization (ISO) is a worldwide federation of national standards bodies. ISO20022 provides the financial industry with a common platform for the development of messages in a standardized Extensible Markup Language (XML) syntax.

- **National Members**

The national members were nominated by each member country of TF3. In principle, the number of national members was limited to one or two persons from each country for effective communication. National members represented the opinions of their respective home markets, as opposed to the opinions of the institution to which they belong. National members were encouraged to form a preparatory working group within their respective markets.

- **National Experts**

With the consent of other national members and the endorsement of TF3, a national member nominated national experts as participants. The national experts provide insight on specific issues related to their respective markets.

- **International Experts**

With the consent of other national members and the endorsement of TF3, a national member nominates international experts as participants in the ABMF. The international experts contribute to discussions related to cross-border transactions in the region.

- **ASEAN+3 Officials**

ASEAN+3 officials participated in any ABMF meeting as an observer. The Chairpersons of the ABMF also invited ASEAN+3 officials from finance ministries, regulatory agencies, security commissions, central banks, and debt management offices and/or relevant sections for issuing public debts, if necessary.

- **Asian Development Bank**

The Asian Development Bank is a member of the ABMF as the Secretariat.

1.5 Work Steps of Sub-Forum 2

In order to enhance STP, SF2 aims to clarify transaction procedures involved in cross-border government bond transactions from one end-user to another. In addition, members identify messaging standards for bond settlement. The work processes of SF2 is provided as follows.

- **STEP 1:**

SF2 members agreed on the scope of the survey. SF2 mainly covered market infrastructures and transaction procedures of government bonds, particularly DVP. In addition, SF2 members agreed on the processes in collecting and sharing information on cross-border transactions.

- **STEP 2:**

The ADB consultant drafted the survey questionnaire for each region, which sought to clarify bond settlement-related infrastructures, transaction procedures, matching, settlement cycles, and other areas in the region's bond markets. It was then distributed to national members and experts for their responses.

- **STEP3:**

ADB secretariat and consultants visited each economy to validate information and data. During such visits, discussions with experts were held to collect more

information. Technical assistance was also provided to Brunei Darussalam and Lao PDR, whose bond markets are still being developed.

- **STEP4:**

The ADB consultant drafted the SF2 report using information from the questionnaire and outputs of the country visits. The report clarified infrastructures and cross-border transaction flows of government bonds, and identified similarities and differences in transaction procedures to discuss how to standardize infrastructures, transaction flows, code scheme, and other related matters.

- **STEP5:**

SF2 members came up with the report on cross-border transaction procedures of ASEAN+3 markets, which will serve as the basis of the succeeding steps for the SF2.

1.6 Schedule of Sub-Forum 2

Members and experts, including ADB consultants, discussed issues of cross-border bond transactions on ABMF meetings, which were held six times from September 2010 through December 2011. The schedule of the SF2 is shown as follows.

Table 1.1 Schedule of Sub-Forum 2

Date		Meeting Schedule	Tasks
2010	September	1st ABMF SF2 in Tokyo, Japan	
	October		Preparation for questionnaire items
	November		
	December	2nd ABMF SF2 in Manila, Philippines	
2011	January		Reply to questionnaire from each region
	February	3rd ABMF SF2 in Kuala Lumpur, Malaysia	Survey of bond transaction flows of each region
	March		
	April	Country visits	Discussion about bond markets and bond transaction flows with national and international experts
	May		
	June	4th ABMF SF2 in Jeju, Republic of Korea	
	July		Supplement survey Draft of this report
	August		
	September	5th ABMF SF2 in Bali, Indonesia	
	October		Finishing the report
	November		
	December	6th ABMF SF2 in Beijing, PRC	

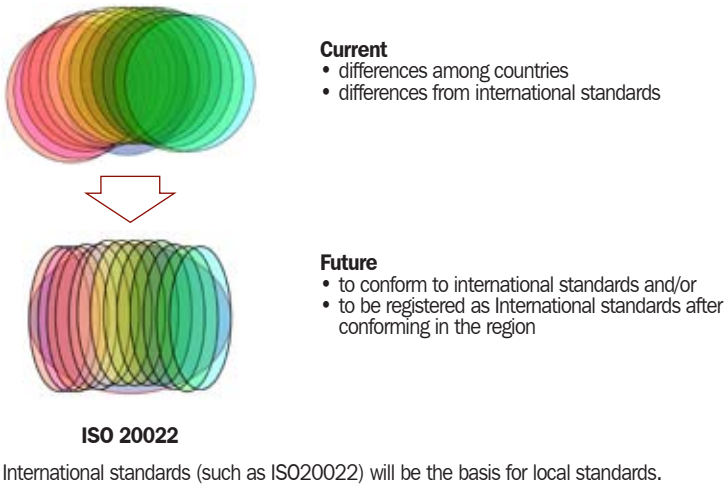
Source: ABMF.

2. Methodology and Approach of the Survey

2.1 Possible Goals of Sub Forum 2

ASEAN+3 proprietary practices (local standards) demonstrate differences from international standards, including ISO 20022. Also, proprietary practices of ASEAN+3 are different from country to country and market to market.

Figure 2.1 Possible Goals of Sub-Forum 2



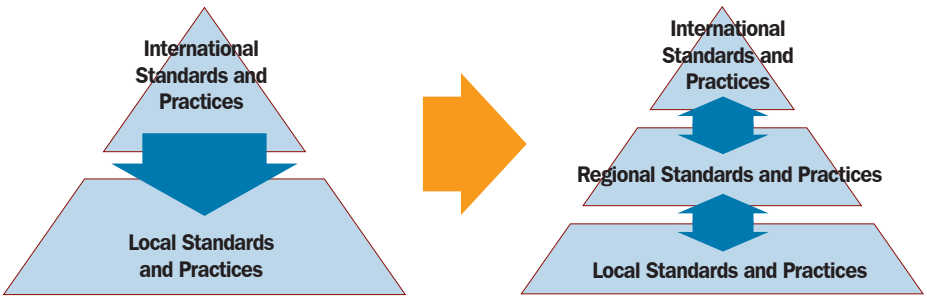
International standards (such as ISO20022) will be the basis for local standards.

Source: ABMF SF2.

Therefore, proprietary practices of ASEAN+3 could be changed to meet international standards. It is important to harmonize practices in the region to make the differences narrower. International standards (such as ISO 20022) should form the basis of local standards to make harmonization a reality. Also, practices in the ASEAN+3 that have been identified as at par with international standards should be considered as a benchmark as well.

In other words, ASEAN+3 should engage more discussions in international forums on standard setting.

Figure 2.2 Contribution of ASEAN+3 to International Standard

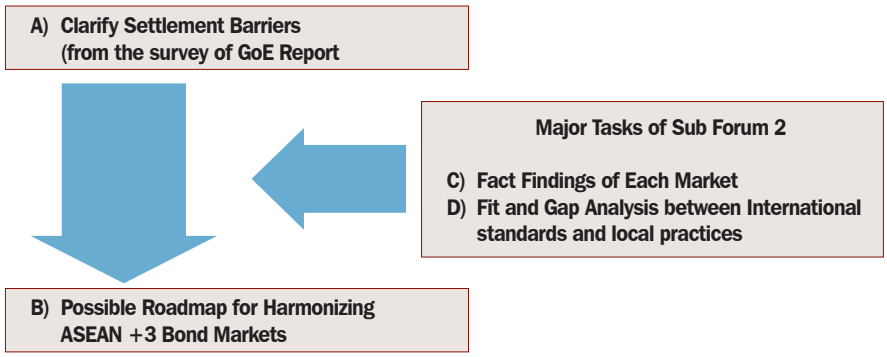


International standards (such as ISO20022) will be the focal point and hub of local standards.

Source: ABMF SF2.

2.2 Methodology Overview

Figure 2.3 Methodology



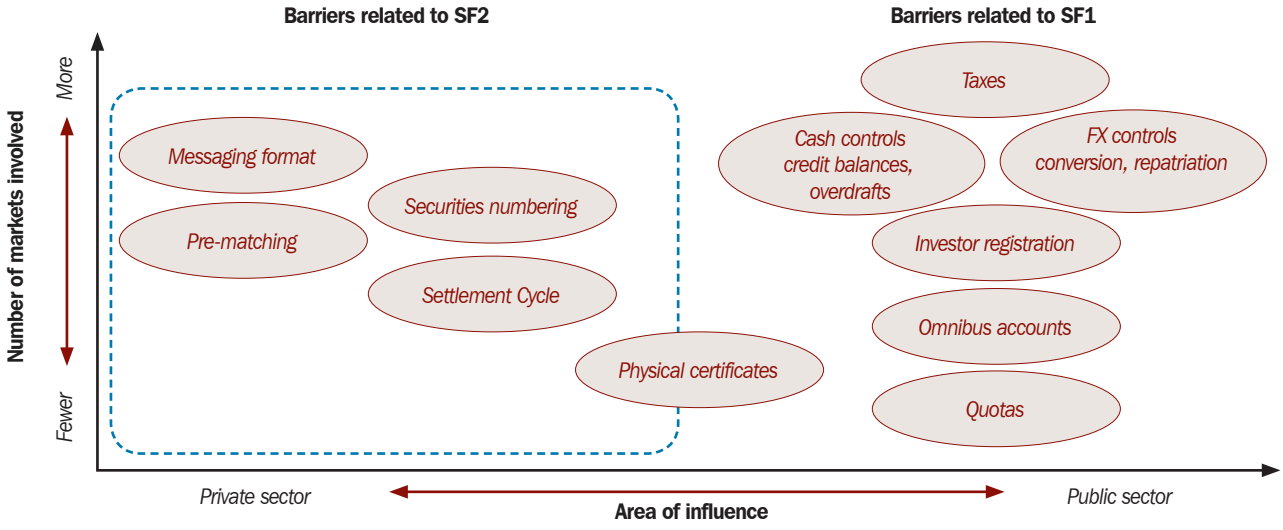
Source: ABMF SF2.

To facilitate the discussion on STP in ASEAN+3, a survey was conducted to examine the current status of government bond markets and their infrastructures. The SF2 conducted the survey based on the output of the GoE Report. As such, the major tasks of the forum included taking stock of government bond-related matters in each market, specifically on related stakeholders, and domestic and cross-border transaction flows. Fit-and-gap analysis between international standards and local practices had to be carried out to actually implement STP in the region.

2.3 Settlement Barriers Based on the Survey on the Group of Experts Report

The GoE Report pointed out the barriers to implement STP in bond markets in ASEAN+3, which is shown in Figure 2.4.

Figure 2.4 Barriers Related to Sub-Forum 2 in the ASEAN+3 Bond Markets



Source: ABMI GoE report.

Settlement-related barriers, including messaging standards, pre-matching, securities numbering, settlement cycle, and physical certificates, are discussed in the succeeding section of this report.

1) Messaging Standards

Messaging standards refer to the use (or non-use) of international standards for securities messaging in a local market. International standards, such as ISO20022, are regarded as necessary for enabling STP in securities post-trade processing. Where local proprietary practices are implemented, this revealed the need for interface and translation either at the level of the global custodian or the local custodian. This came with associated costs of development and maintenance, as well as greater risk of error. In some cases, the local CSD does not use ISO messaging standards.

2) Trade and Settlement Matching

This refers to the matching of trade details between counterparties. Matching may take two forms: trade matching and settlement matching.

a) **Trade matching.** Details of the trade are compared between the counterparties to ensure that there is no misunderstanding of the terms of the trade. This should be performed as soon as after the trade is executed, and, in any event, before the end of the business day. With automated trading systems (e.g., exchange systems or electronic OTC systems) matching is done at the time of trade, so there is no need for subsequent trade matching. However, many bond trades are done by telephone.
b) **Settlement matching.** Details of the agreed trade are compared between the counterparties' settlement agents (e.g., local custodian and local broker) to ensure that all information needed for settlement is in place.

Most markets in ASEAN+3 operate some form of automated matching systems but some do not. The absence of automated matching is likely to lead to increased settlement failures and make it more difficult to shorten the settlement cycle.

3) Securities Numbering

This refers to the use (or non-use) of International Securities Identification Number (ISIN) in accordance with ISO 6166 for securities numbering in a local market. As with securities messaging, non-use of ISIN makes STP more difficult and increases the risk of error. Most ASEAN+3 markets now have established local agencies for issuing and administering ISIN for locally issued securities. The limitations may be as follows:

a) ISINs are not available on the issue date of the bonds, making trading and settlement more difficult.
b) ISINs are not widely used by local market participants.
c) ISINs are not used by local CSDs, instead local securities codes are widely used.

4) Settlement Cycle

This refers to the number of days between trade date and settlement date. Most markets operate on a standard settlement cycle. Typically this is trade date plus 1 (T+1) for government bonds, and T+2 or T+3 for corporate bonds (and equities). A short settlement cycle is better for local market participants, as it reduces counterparty risk.

However, non-resident investors may find it difficult to settle on T+1 if they or their global custodian are located in a different time zone. For this reason, such investors look for the ability to negotiate a longer settlement period (T+2 or T+3 is the favored cycle). Settlement cycle as a market rule in the region is yet to be established.

5) Physical Certificates

Most bonds today are in dematerialized form held in book-entry at the local securities depository or central bank system. Some bonds are still in paper certificate form. The disadvantage of physical certificates are obvious—the need for manual examination, risk of loss, damage or forgery, and cost of storage. Typically, these remaining physical bonds are not of great interest to cross-border investors, and are unlikely to be traded at all. The ideal situation, clearly, is dematerialization. An intermediate step is to hold physical certificates, where they exist, in vaults of local securities depository for immobilization.

2.4 Survey Questionnaire

In order to try to reach its goals, SF2 conducted a survey on the issues related to barriers by sending a questionnaire to national members and international experts. The following are the primary categories of the questionnaire:

a) Bond market infrastructures
b) CSDs in each country
c) Typical business flowchart
d) Matching
e) Settlement cycles
f) Standards, including numbering and coding
g) ISO and local practices
h) Transaction costs
i) Medium- to long-term strategy
j) Any other information

The detailed questionnaire is shown in Appendix 1.

The SF2 survey revealed not only message formats but also business processes, such as message transactions and message flows, that need to be integrated in the survey.

Preliminary answers for bond market infrastructures, CSDs in each country, and standards including numbering and coding are shown in Appendix 2. Survey results on typical business flowchart, matching, and settlement cycles are discussed later. ISO and the local practices, transaction costs, and medium- to long-term strategy will be discussed in the next phase of the survey.

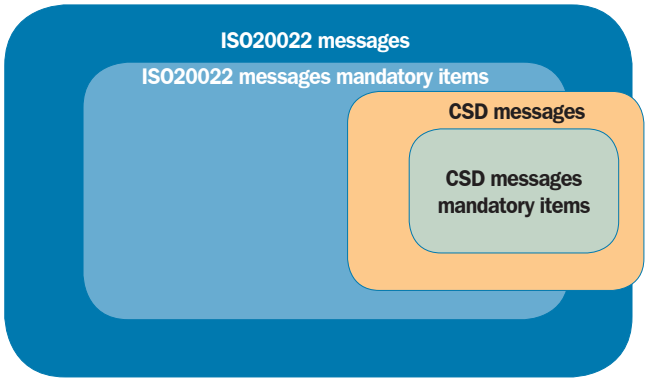
2.5 Fit-and-Gap Analysis

2.5.1 Background on Fit-and-Gap Analysis of Bond Transactions

Interoperability among bond trade, settlement systems, and infrastructures are very important to bring to fruition STP of bond transactions. In fact, some CSDs in ASEAN+3 have already adopted the ISO standard as their message standard when they reconstruct or upgrade their bond settlement infrastructures. However, not all CSDs and

bond trade and settlement-related infrastructures are compliant with the international standard yet. Also, there remain some differences between infrastructures, which have already adopted the ISO standard for their message format.

Figure 2.5 ISO20022 and Central Securities Depository Messages



Source: ABMF SF2.

As such, there are some differences in proprietary CSD messages and ISO 20022 messages in some markets that do not follow the international standard. Also, bond trade and settlement-related infrastructures, including CSDs that have already implemented the ISO standards as their message standard, may still have their own proprietary flows and processes, which may be better than the ISO standards.

Therefore, a fit-and-gap analysis between bond transactions of each market and international standards is one of the most important steps to harmonize bond markets in ASEAN+3.

2.5.2 Scope of Fit-and-Gap Analysis

There are some levels in doing the fit-and-gap analysis of messages. A fundamental level is to check whether or not the business flow requiring a specific message exists. More specifically, it checks whether basic messages, such as bond settlement instructions and confirmation, need to be compared. Another important part of the analysis is to compare bond transaction flows. After conducting the basic fit-and-gap analysis, message items and formats may be compared and analyzed.

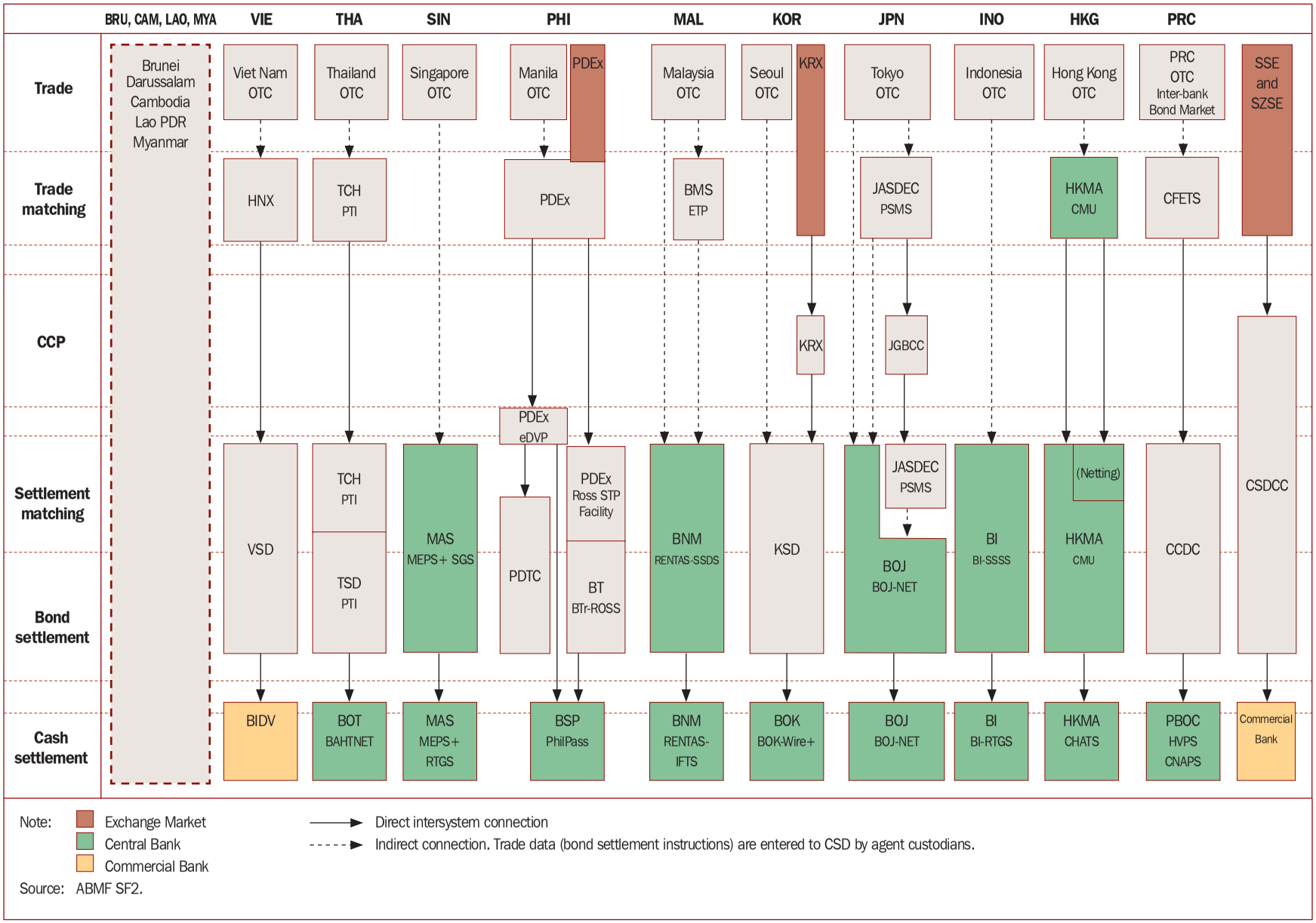
As a preliminary stage of the survey, a fit-and-gap analysis of messages and their flow were conducted. In order to do that, cross-border bond transaction flows and domestic bond transaction flows were surveyed.

3. Overview of the ASEAN +3 Bond Markets and Infrastructures

3.1 Overview of ASEAN+3 Government Bond Markets

This section discusses the ASEAN+3 government bond markets and their infrastructures. An overview of the markets is shown in Figure 3.1.

Figure 3.1 ASEAN+3 Government Bond Market Infrastructure Diagram



In the ASEAN+3, most countries have already developed their respective government bond markets, with the exception of Brunei Darussalam, Cambodia, Lao PDR, and Myanmar. In all the countries and economies with developed bond markets, government bonds are mainly traded in over-the-counter (OTC) markets. In a few countries including Korea and the Philippines, significant volume and value of government bonds are traded on exchanges. In China, only a small percentage of government bonds are traded on exchanges, and non-residents, known as Qualified Foreign Institutional Investors (QFII), have access to the Shanghai Stock Exchange and Shenzhen Stock Exchange.

In China, Hong Kong, Japan, Malaysia, the Philippines, Thailand, and Viet Nam, traded data are entered into trade or post-trade infrastructures such as trade-matching systems.[4] Data entered into these trade-related infrastructures are transmitted to CSDs in China, Hong Kong, Korea (in the KRX), the Philippines, Thailand, and Viet Nam.

Two economies—Korea (KRX) and Japan (Japan Government Bond Clearing Corporation [JGBCC])—have established a central counterparty (CCP) for bond trades in ASEAN+3. A new CCP has started its operation in December 2011 in China (through the Shanghai Clearing House [SHCH]). However, the CCP is utilized only for domestic transactions in each region.

In Hong Kong, Indonesia, Japan, Malaysia, and Singapore, central banks operate the CSD. Cash settlement of government bond delivery-versus-payment (DVP) transactions is provided by central banks, except for Viet Nam.

In the region, almost all bond transactions practically stay within the economies and not reach other markets outside the country's borders. This means there are still comparatively small cross-border transactions in the region.

Generally, bond settlement systems and cash settlement systems are connected directly for the sake of DVP settlement. In the Philippines, there is unique system structure where the Philippine Dealing and Exchange Corporation (PDEx) controls all DVP settlement processes; therefore, the system structure is different from that of other markets. All markets, except for Viet Nam, provide real-time gross settlements for government bonds by using central bank money in the form of DVP Model 1 as defined by the Bank for International Settlements (BIS).[5] In Viet Nam, all trades are settled by using commercial bank money after netting. Currently, it is planning to reconstruct its bond market infrastructures.

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4 In general, only domestic transactions use the trade-matching system. Therefore, cross-border bond transaction go directly to the settlement-matching system or CSD.

5 **Model 1** is defined as system that settles transfer instructions for both securities and funds on a trade-by-trade (gross) basis, with final (unconditional) transfer of securities from the seller to the buyer (delivery) occurring at the same time as final transfer of funds from the buyer to the seller (payment); **Model 2** is defined as the system that settles securities transfer instructions on a gross basis with final transfer of securities from the seller to the buyer (delivery) occurring throughout the processing cycle, but settle funds transfer instructions on a net basis, with final transfer of funds from the buyer to the seller (payment) occurring at the end of the processing cycle; and **Model 3** is the system that settles transfer instructions for both securities and funds on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.

3.2 General Observations on ASEAN+3 Bond Market Infrastructures

a) **Robust and sound bond infrastructures.** Each market in ASEAN+3 has its own robust and sound infrastructures. Operational risk associated with the systems is comparable with those of developed markets.

b) **Listed at exchanges and traded in OTC markets.** Bonds are listed at stock exchanges; however, these are mostly traded over the phone or through other communication tools by negotiation among brokers and dealers. Bond markets in the region are generally OTC markets. This is also common elsewhere since bond trade is normally quote driven where dealers need to negotiate the price. In contrast, exchange trade is order-driven where all orders of buyers and sellers can be seen and matched by the system. Korea and the Philippines are the only exception, where the exchange has a substantial market share because benchmark bonds are mostly traded at the exchange. In China, bond trades at the stock exchanges are very limited; foreign investors, who are classified as QFII, can trade bonds at the exchanges.

c) **Central counterparty**. A central counterparty (CCP) for bond trades does not exist in many markets. However, this is understandable because transaction volume is still limited in these markets. As trade volume increases, it is expected that CCP will be introduced into the markets when needed.

d) **Matching.** All markets have a concept of matching at a trade or settlement level, or even at both levels. Some markets adopt central matching while others do local matching. Also, matching with additional features, such as reduction of input workloads, is implemented in some markets. However, there is a need to automate manual pre-matching.

e) **Settlement cycle.** Settlement cycles for domestic bond transactions in many markets are already realized at T+1, but market practices of cross-border bond transactions depend on each market player, which are more than T+2 and negotiable. Settlement cycle as a market rule still needs to be discussed.

f) **Cash settlement by central bank money.** With exception of Viet Nam, all markets use central bank money to settle cash component of bond trades. In some countries, cash may be settled directly through accounts of individual financial institutions while, in the other countries, the CSD has an account with the central bank and cash is settled through the account.

g) **Harmonization of terminologies and definitions.** Technical terminologies need to be standardized before harmonizing systems and messaging in the region.

4. Domestic Bond Transaction Flow

4.1 Model Domestic Bond Transaction Flow

This section of the report discusses the government bond transaction flows in each ASEAN+3 economy from the perspective of STP. In many markets in ASEAN+3, government bonds are mostly traded through DVP in OTC markets.[6] A model transaction flow is chosen from among the most prevailing transaction flow, and is used as a point of comparison for the transaction flows in the different markets in the region, as demonstrated in Figure 4.1.

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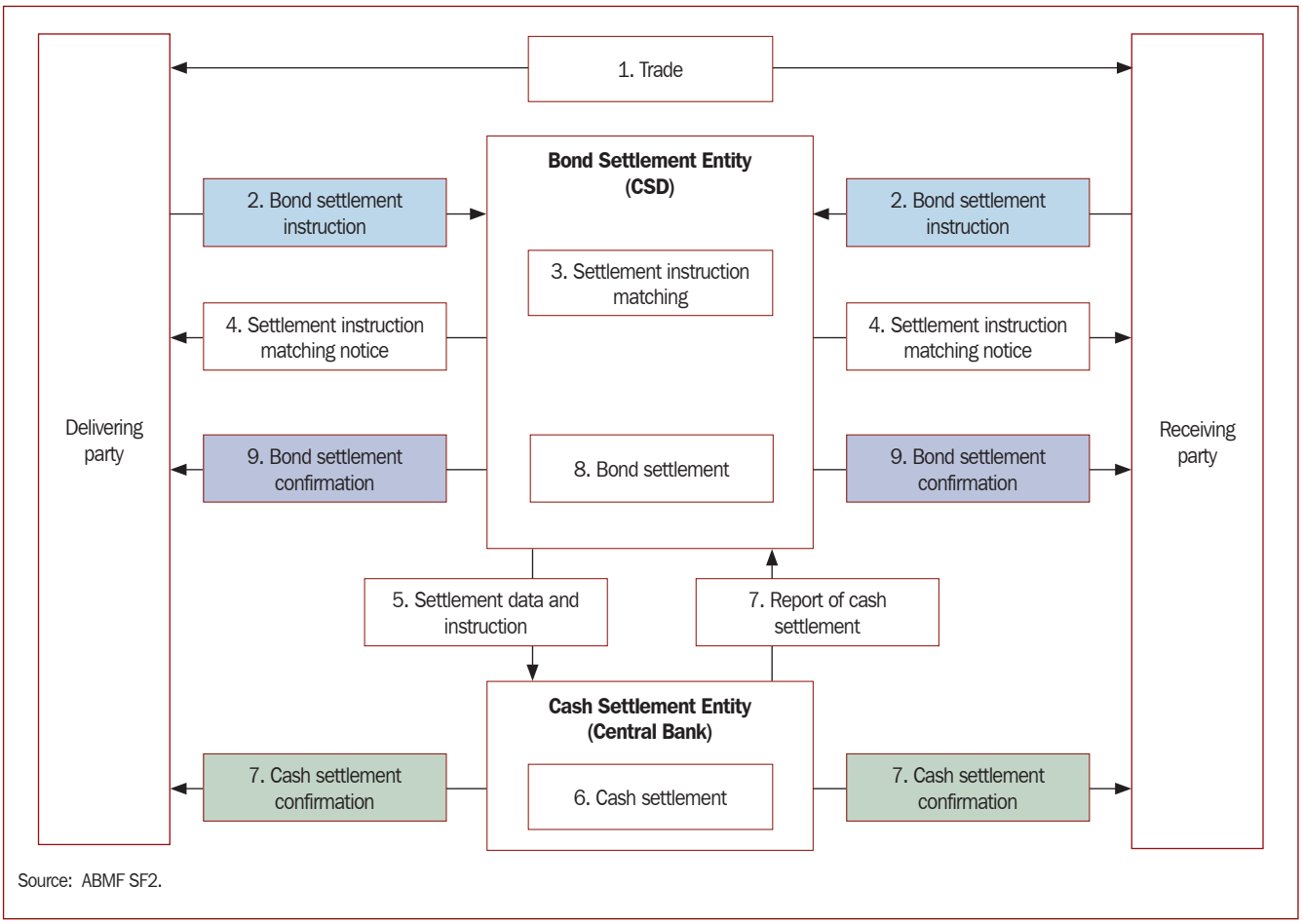
6 See Part 2 of this report.

Figure 4.1 Model Domestic Bond Transaction Flow (1)



Source: ABMF SF2.

In this typical flow, market participants (seller and buyer)[7] trade bonds by telephone, email, or other means. Then, they input the settlement instructions to the CSD directly. The CSD executes matching processes with the data sent by the seller and buyer. The results of settlement matching are sent back to the seller and buyer from the CSD. If the data are matched, the CSD continues the process and starts the DVP settlement processes. Under a DVP process, the CSD and cash settlement entity (mostly central bank in each country) execute the bond settlement if, only if, cash settlement is completed. Settlement data are sent to a cash settlement entity from the CSD, while the seller and buyer do not give instructions to the cash settlement entity directly. After the settlements are completed, the CSD and cash settlement entities send the settlement confirmation to the seller and buyer.

4.2 Categorization of Domestic Government Bond Transaction Flow

1) Model Flow

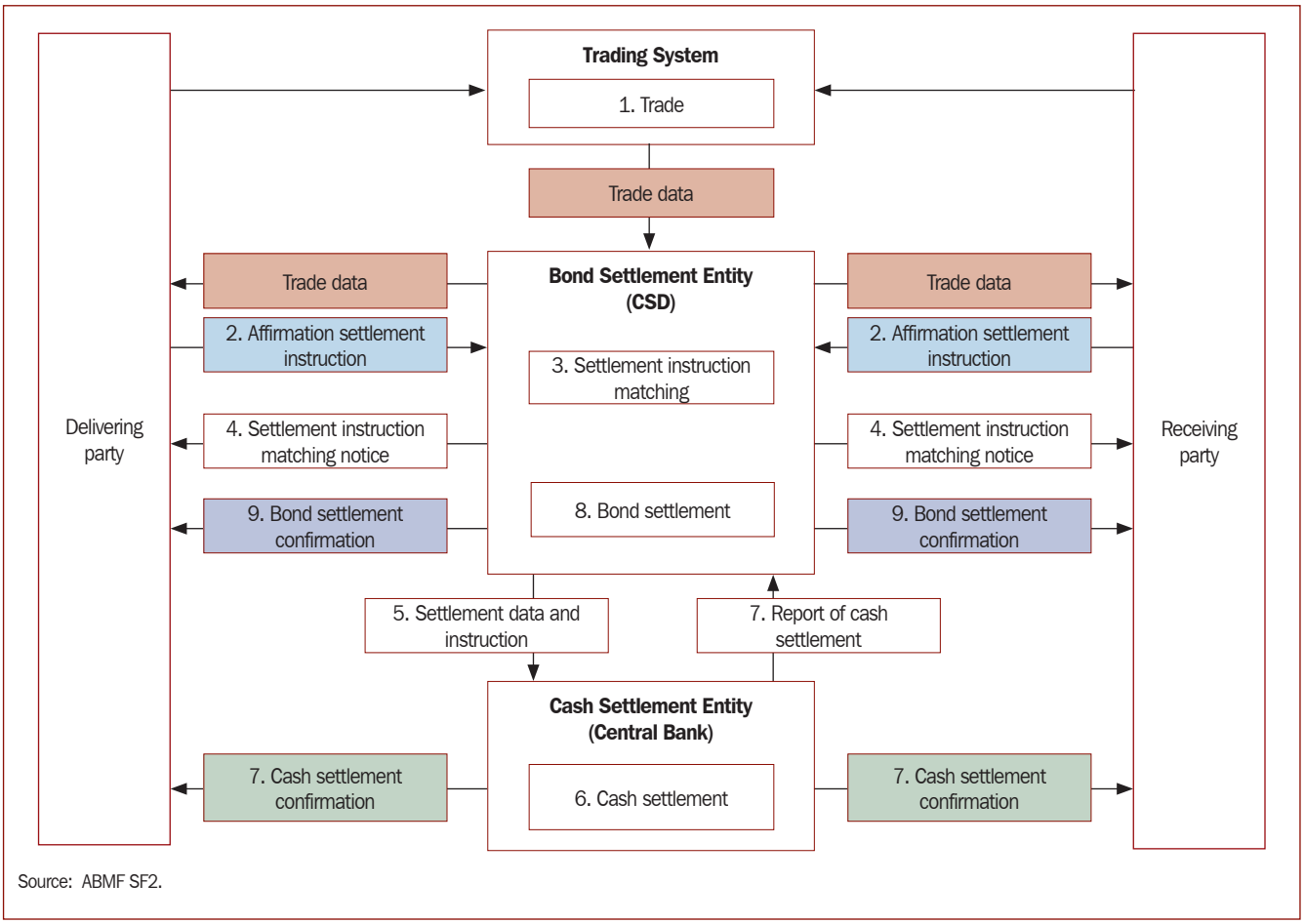
Government bond transaction flows in Hong Kong, Indonesia, Korea (OTC), and Thailand fall into the model flow.

[7] Seller means delivering party of the bond. Buyer means receiving party of the bond.

2) Transmitting Trade Data from the Trade System to the Central Securities Depository

China's OTC market is similar to the model, but has STP function transmitting trade data directly from the trade platform of the China Foreign Exchange Trade System (CFETS) to the China Central Depository and Clearing Corporation (CCDC), which is a CSD as shown in Figure 4.2. The Philippines and Viet Nam are similar to in terms of trade data transmission from a trade platform to a CSD. In the Philippines, PDEx facilitates (controls) all transactions to CSDs. In Viet Nam, most of the bonds are traded in the OTC market, and trade data are entered to the Hanoi Exchange (HNX). This process is similar to that of China's and Korea's exchanges.

Figure 4.2 Model Domestic Bond Transaction Flow (2)

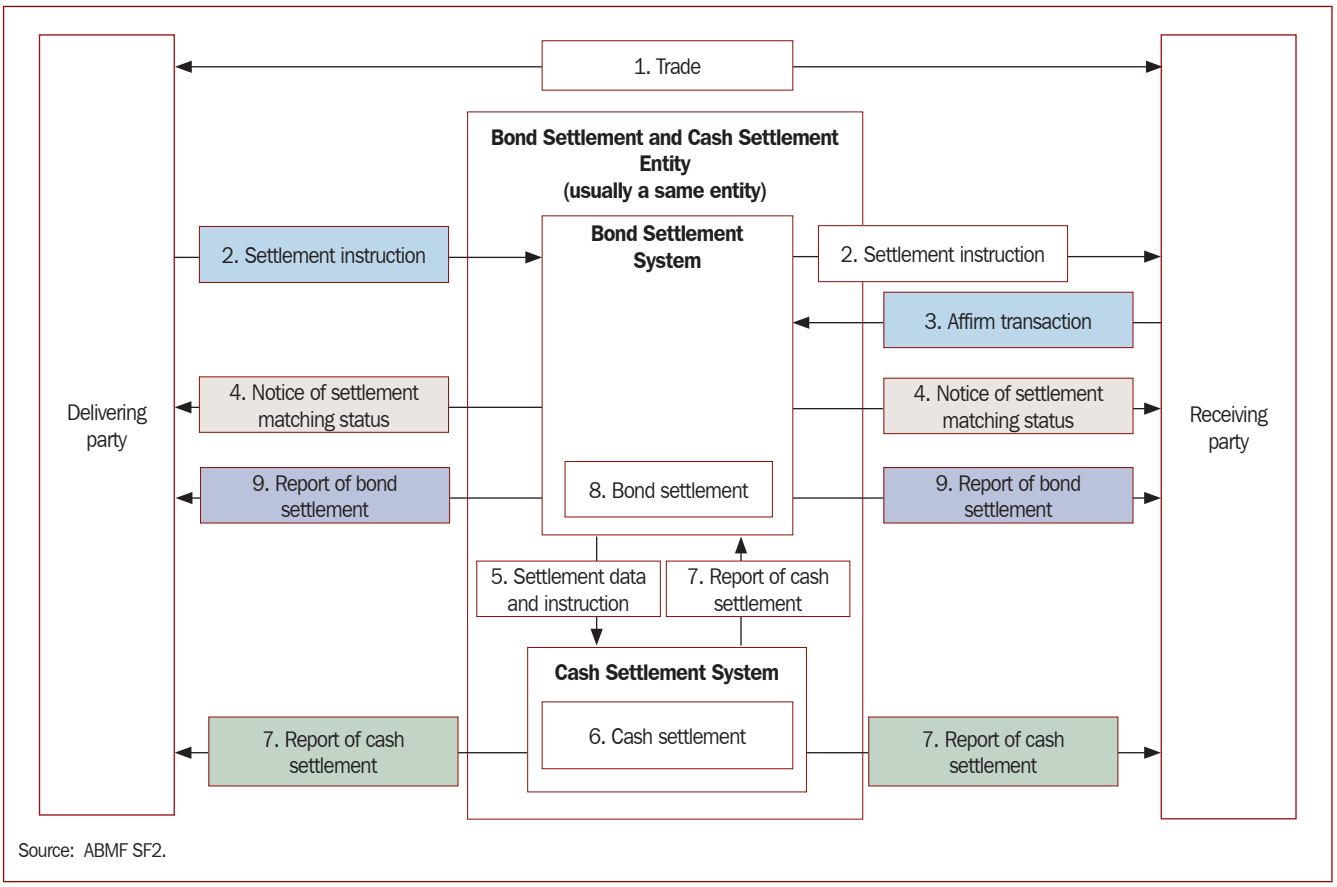


Source: ABMF SF2.

3) Local Matching and Tight Connection between Central Securities Depository and Real-Time Gross Settlement

Another variant is that the central bank owns and operates the CSD and real-time gross settlement (RTGS) systems in Japan, Malaysia, and Singapore. Either seller or buyer enters the trade data (bond settlement instruction) to the CSD, which is classified as local settlement matching as shown in Figure 4.3.

Figure 4.3 Model Domestic Bond Transaction Flow (3)



Source: ABMF SF2.

4.3 Settlement Instruction and Confirmation of Bond and Cash

Table 4.1 shows (i) transmission of trade data from trade-related platform (trading system) to the CSD, (ii) bond settlement instruction from the seller or buyer to the CSD, (iii) bond settlement confirmation from the CSD to the seller and buyer, (iv) cash settlement instruction from the buyer to the CSD, and (v) cash settlement confirmation from the CSD to the seller and buyer, in each economy by comparing the bond transaction flow with the model flow.

Table 4.1 Settlement Instruction and Confirmation of Bond and Cash

Economy	Market	Transmission of Trade Data before the Settlement Instruction	Bond Settlement Instruction	Bond Settlement Confirmation	Cash Settlement Instruction	Cash Settlement Confirmation
PRC	OTC	• From the trading system	• From seller and buyer [1] • Affirmation of the settlement	• From CSD to seller and buyer	• From CSD	• From Central Bank to seller and buyer
	Exchange	• From the trading system	• From seller and buyer • Affirmation of the settlement	• From CSD to seller and buyer	• From CSD	• From CSD and Payment Banks to seller and buyer
HKG	OTC	• None	• From seller and buyer • Settlement Data and instruction	• From CSD to seller and buyer	• From CSD	• From Central Bank to seller and buyer
INO	OTC	• None	• From seller and buyer • Settlement Data and instruction	• From CSD to seller and buyer	• From CSD	• From Central Bank to seller and buyer

continued on next page

Table 4.1 continuation

Economy	Market	Transmission of Trade Data before the Settlement Instruction	Bond Settlement Instruction	Bond Settlement Confirmation	Cash Settlement Instruction	Cash Settlement Confirmation
JPN	OTC	• None	• Instruction from buyer (or seller) • Affirmation from seller (or buyer)	• From CSD to seller and buyer	• From buyer (or seller)	• From Central Bank to seller and buyer
KOR	OTC	• None	• From seller and buyer • Affirmation of the settlement	• From CSD to seller and buyer	• From CSD	• From Central Bank to seller and buyer
	Exchange	• None	• From the trading system • Settlement Data and instruction	• From CSD to seller and buyer	• From CSD	• From Central Bank to seller and buyer
MAL	OTC	• None	• Instruction from buyer (or seller) • Affirmation from seller (or buyer)	• From CSD to seller and buyer	• None (one entity executes both of the bond and cash settlement	• None (integrated with the Bond Settlement Confirmation)
PHI	OTC GSED	• From the trading system	• From seller and buyer to DVP controlling system • From DVP controlling system to CSD	• From DVP controlling system to seller and buyer	• From CSD	• From Central Bank to seller and buyer
	OTC nonGSED	• From the trading system	• From seller and buyer to DVP controlling system • From DVP controlling system to CSD	• From DVP controlling system to seller and buyer	• From DVP controlling system	• From Central Bank to seller and buyer
SIN	OTC	• From seller (or buyer)	• Instruction from buyer (or seller) • Affirmation from seller (or buyer)	• From CSD to seller and buyer	• From CSD	• From cash settlement entity to seller and buyer
THA	OTC	• None	• From seller and buyer • Settlement Data and instruction	• From CSD to seller and buyer	• From CSD	• From Central Bank to seller and buyer
VIE	OTC	• From the trading system	• From seller and buyer • Affirmation of the settlement • Clik on CSD's web site	• seller and buyer can refer to the status of transaction on web pages	• From CSD	• seller and buyer can refer to the status of transaction on web pages

[1] About 5% of trades are directly entered to CCDC after traded in China OTC Market. In this case, one party (either seller or buyer) needs to send settlement instruction into CCDC system. The settlement instruction needs to contain full message items necessary for the settlement. CCDC system will automatically ask the other party to confirm. If not, CCDC won't process settlement. After matching the order (local matching). CCDC will settle the trade in FOP or DVP as requested by customers.

Source: ABMF SF2.

4.3.1 Bond Settlement Instruction

In China, Korea (Exchange), the Philippines, and Viet Nam, trade data are entered from trade-related platform to the CSD directly through a network. In China, the data are forwarded to the seller and buyer to save the input workload for both. The seller and buyer send back affirmation to express their willingness to sell or buy the bond. In Korea (Exchange), the Philippines, and Viet Nam, trade data entered into the trade-related platform are directly transmitted to the CSD and regarded as bond settlement instructions for DVP. There are no explicit affirmation processes for Korea (Exchange) and the Philippines. Sellers and buyers can check transaction details from web terminals by accessing the trading system. In Viet Nam, after receiving the trade results from stock exchanges, VSD sends the notices of cash/securities multilateral netting and settlement to buying and selling members. Buying and selling members need to confirm the accuracy of trade result from their side. Based on these confirmation, VSD effects the settlement without changing the status of the transaction in the central database from members. In other markets, the seller and/or buyer need to relay the bond settlement instruction to the CSD explicitly by sending the instruction or by returning affirmation on the forwarded inquiry with trade details.

4.3.2 Bond Settlement Confirmation

In China, Hong Kong, Japan, and Korea, bond settlement confirmation is sent from the CSD to the buyer and seller. In other markets, the seller and buyer need access to the CSD, such as PDEx in the Philippines, to retrieve the result.

4.3.3 Cash Settlement Instruction

Japan and Korea need to explicitly send cash settlement instruction for DVP transactions. In other markets, receiving settlement data from the CSD (i.e., PDEx in the Philippines) is regarded as sufficient authority to debit the value of the bond from the buyer's current account.

4.3.4 Cash Settlement Confirmation

In Japan, Malaysia, and Singapore, trade data are entered into the CSD from the seller and/or buyer. Both CSDs and cash settlement entities are owned and operated by their respective central banks.

4.4 Communication Protocol and Message Format

The communication protocol between market participants and CSDs in each market is mostly transmission control protocol/Internet protocol (TCP/IP), while message formats vary from market to market, and do not have de facto standard. Most of the protocols between market participants and cash settlement entities also use TCP/IP.

Protocols and Message formats in each market are listed in the table below.

Table 4.2 Protocols and Message Formats in ASEAN+3 Bond Markets

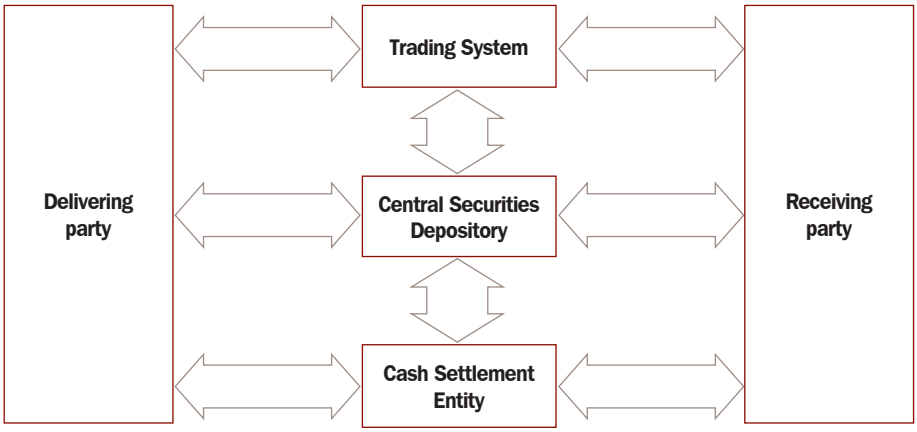
	Market	1. Between CSD and Seller/Buyer			2. Between Cash Settlement System	
		Linkage	Protocol	Message Format	Protocol	Message Format
PRC	OTC	direct link	• TCP/IP • HTTP, SOAP	• XML and Text	• TCP/IP	–
HKG	OTC	direct link	• TCP/IP	• ISO 15022	• TCP/IP	• SWIFT
INO	OTC	terminal access	• SNA. TCP/IP will be adopted	• Proprietary. SWIFT will be adopted.	• SNA. TCP/IP will be adopted.	Proprietary. SWIFT will be adopted.
JPN	OTC	direct link	• TCP/IP	• Proprietary. ISO20022 will be applied (CSV and XML).	• TCP/IP	Proprietary. ISO20022 will be adopted.
KOR	OTC	direct link	• TCP/IP	–	• TCP/IP	–
MAL	OTC	terminal access	• TCP/IP	–	• TCP/IP	–
PHI	OTC GSED	terminal access	• TCP/IP • HTTPS	• Proprietary	• TCP/IP	• SWIFT
SIN	OTC	terminal access	• TCP/IP	–	• TCP/IP	–
THA	OTC	terminal access	• TCP/IP • HTTPS	–	• TCP/IP	–

CSV = Comma Separated Value, GSED = government securities eligible dealer; HTTP = Hyper Text Transfer (or Transport) Protocol; ISO = International Organization for Standardization; OTC = over-the-counter, SNA = Systems Network Architecture; SOAP = Simple Object Access Protocol; SWIFT = Society for Worldwide Interbank Financial Telecommunication; TCP/IP = Transmission Control Protocol/Internet Protocol; XML = Extensible Markup Language
– = no information.
Source: ABMF SF2.

Some CSDs have direct linkages with market participant's systems. In the future, ABMF SF2 can promote to build an environment for cross-border transactions by standardizing the message format of the linkages based on international standards.

While there is little information about message formats, such standardization makes possible the reduction of systems cost of market participants. The standardization of protocols between the trading system and CSDs may be discussed in future initiatives to standardize the communication protocol in ASEAN+3 bond markets.

Figure 4.4 Network Between Market Participants



Source: ABMF SF2.

4.5 Reporting to Self-Regulatory Organizations for Trade Transparency

Some markets in ASEAN+3 have rules that market participants have to report trade data to authorities including self-regulatory organizations (SROs) for trade transparency. Some examples of such rules in the region are described as follows.

Table 4.3 Reporting Rules in ASEAN+3 Markets

Economy	Entity Which Receive a Report	Reporting Rule
PRC	China Foreign Exchange Trade System (CFETS)	The trade data are entered to CFETS for price transparency.
HK	–	–
INO	Indonesia Stock Exchange (IDX)	The seller or buyer have to report trade data to Centralized Trading Platform (CTP) of Indonesia Stock Exchange (IDX) within 30 minutes of trade.
JPN	–	–
KOR	Korea Financial Investment Association (KOFIA)	A financial investment company engaged in bond trading should report the details to KOFIA.
MAL	Bursa Malaysia (BM)	BM runs Electronic Trading Platform (ETP), and the seller and buyer have to input all trades to ETP.
PHI	Philippine Dealing and Exchange Corporation (PDEx)	The seller or buyer have to report trade data to Philippine Dealing and Exchange Corporation (PDEx).
SIN	–	–
THA	ThaiBMA	All debt securities trading transactions, wherever it is done, must be reported to the ThaiBMA. The ThaiBMA monitors the reported price data to ensure that disseminated prices are accurate to be used as market reference.
VIE	–	–

– = no information.
Source: ABMF SF2.

In Indonesia, the Indonesia Stock Exchange (IDX) functions as a bond transaction-reporting center. The seller or buyer is obliged to report trade data to the centralized trading platform (CTP) of the IDX within 30 minutes of trade.

In Korea, the Korea Financial Investment Association (KOFIA) functions as an SRO. Financial investment companies engaged in bond trading should report the details of trade to KOFIA, and KOFIA discloses this information on its website.

In Malaysia, Bursa Malaysia (BM) is an SRO responsible to improve trade transparency in the Malaysian bond market. BM runs an electronic trading platform (ETP), where the seller and buyer have to input all trades.

In Thailand, all debt securities trading transactions, wherever it is done, must be reported to the Thai Bond Market Association (ThaiBMA). The ThaiBMA monitors the reported price data to ensure that disseminated prices are accurate as market reference.

Trade data collection and reporting scheme are very important issues that need to be addressed to make ASEAN+3 markets more sound and transparent. Also, this kind of initiative may be related to the activities of the ASEAN+3 Macro-economic Research Office (AMRO).

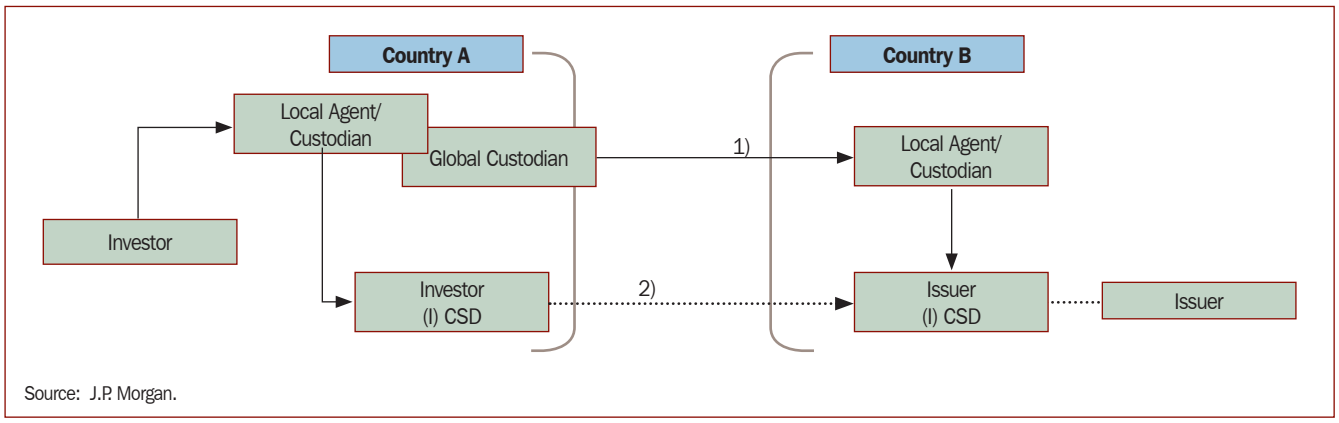
5. Cross-Border Bond Transaction Flow

In this section, inflow investments in bonds by non-residents are discussed to illustrate a typical cross-border transaction flow. Delivery versus payment (DVP) of government bond transactions is chosen as a model of business flow, considering that the government bond is a typical bond instrument traded in the form of DVP in ASEAN+3.

5.1 Possible Channels of Cross-Border Bond Transaction Flow

In ASEAN+3, channels to buy bonds are available for investors (classified as non-residents) whose domicile is different from where the bonds are to be purchased. These channels are shown in Figure 5.1.

Figure 5.1 Possible Channels of Bond Transaction Flow



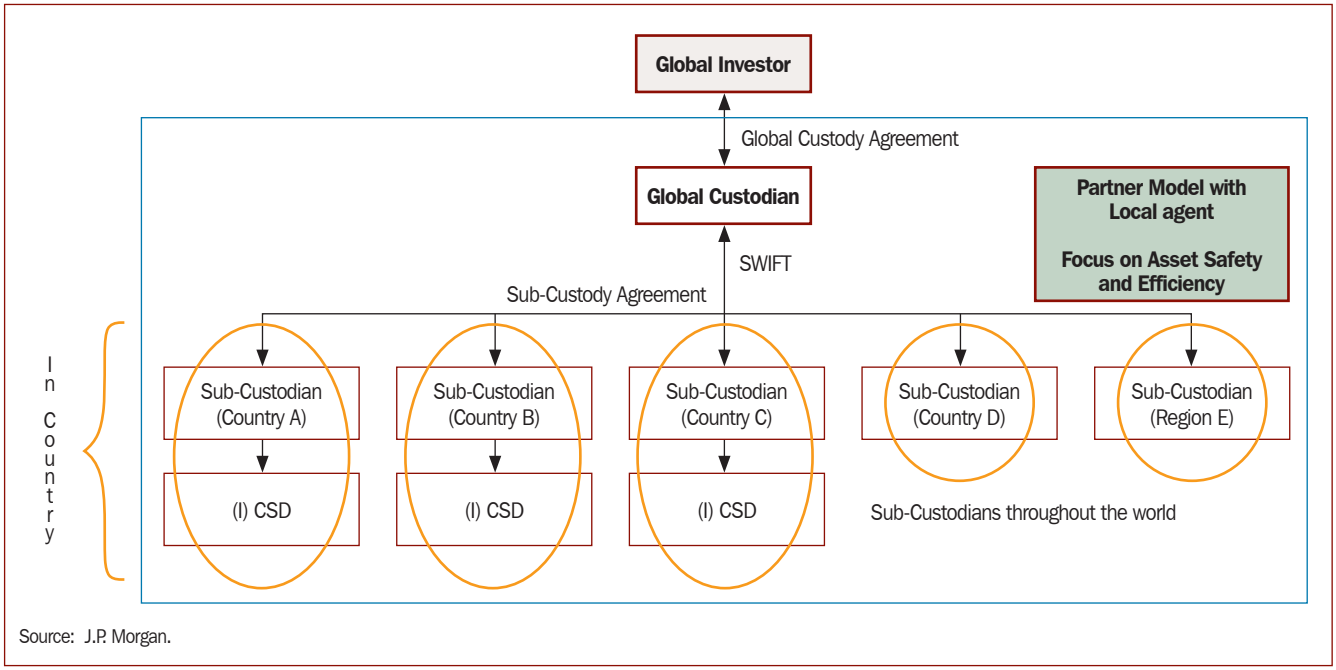
Source: J.P. Morgan.

These channels include:

1) Local agency or custodian in country B that has direct or indirect access to the foreign (issuer) CSD;
2) A(n) (I)CSD that has direct or indirect access to the foreign (issuer) CSD; and

This report focuses on the channel to use a local agency or custodian since this is the most prevailing means for cross-border transactions in ASEAN+3. In this case global and local custodians play specific roles for foreign institutional investors to settle transactions in the region. An overview of global custodian model is shown in Figure 5.2.

Figure 5.2 An Overview of Custodian Model



Source: J.P. Morgan.

5.2 Model Cross-Border Bond Transaction Flow

A model cross-border bond transaction flow is shown in Appendix 3-1, which takes into account the situation in ASEAN+3 as discussed previously. Since bond trades and settlements are products of many elements including documented regulations, visible standards, market practices, intricacies and nuances of markets, and history, many variations of cross-border bond transaction flows can be found in the region. Therefore, the most common cross-border bond transaction flow in the region is chosen. As such, the model cross-border bond transaction flow does not necessarily represent a best-practice model, but rather the most typical flow in the region. The model bond-transaction flow is compared with the different cross-border transaction flows in ASEAN+3 to come up with harmonized bond transactions in the region.

Appendix 3-2 shows the roles and needs of the various stakeholders in cross-border bond trading and settlement, which includes foreign institutional investors, global custodians, local custodians, CSDs, and cash settlement banks.

5.3 Some Issues on Cross-Border Bond Transactions in ASEAN+3

This section discusses the impact of settlement barriers to cross-border transaction flows in each market in ASEAN+3, as identified in the GoE Report. The typical flow in each market is compared with the model cross-border bond transaction flow.

Flows related to foreign institutional investors, global custodians, and domestic custodians are also discussed in this section. This takes into account that domestic bond transaction flows take place between domestic custodian (including cash correspondent bank) and bond settlement infrastructures (including CSD and RTGS systems). Causes of additional processes in the typical transaction flow, compared with the model transaction flow, include taxes, currency exchange controls, cash controls, and foreign investor registration. Other issues such as manual pre-settlement matching are also discussed in this section.

5.3.1 Tax

In Indonesia, there are additional bond transaction flows related to capital gains tax for bond trades. When a domestic custodian conducts pre-settlement matching with a counterparty, the amount of capital gains tax is calculated and agreed with the counterparty. The information on capital gains tax is sent from the domestic custodian to the global custodian with the pre-matching status. The global custodian requests the foreign institutional investor to amend the settlement amount, taking the capital gains tax into account. The amended settlement instruction is sent from the foreign institutional investor to the global custodian, and from the global custodian to the domestic custodian for pre-settlement matching with the counterparty using amended amount.

The impact of tax on bond trades and settlements have been previously discussed in several papers, particularly on withholding tax. The withholding tax is mainly regarded as an impediment to interest payments and redemption. Therefore, the withholding tax remains one of the important challenges, though it may not have a significant negative impact on bond transaction flow for trade, particularly on DVP.

5.3.2 Currency Exchange and Cash Controls

Currency exchange controls and cash controls are related to the level of currency convertibility and policy of regulators, including monetary authorities and central banks. In China, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam, real-demand principle for obtaining local currency in the foreign exchange regime exists. Also, in some countries, there are controls over the local currency credit facilities imposed on non-residents. In China, lending to non-residents (overseas institutions), or contracting foreign credit, is restricted to financial institutions authorized by the People's Bank of China. In Indonesia, foreign exchange transactions need to be executed through banks incorporated in Indonesia and licensed by Bank Indonesia. In Korea, credits and loans worth more than KRW1 billion (a borrower denominated in local currency and granted by institutional investor) require the Bank of Korea's approval. Korean law also prohibits extending credit for speculation purposes to non-residents. In Malaysia, banking institutions may extend credit facilities up to an aggregate limit of MYR10 million to a non-resident for any use in Malaysia other than for financing purposes or construction of immovable properties. In the Philippines, peso loans to non-residents by resident banks are not allowed under local central bank regulations. Overdraft is also not allowed. FX swaps with non-residents require prior central bank approval. Foreign portfolio investments are required to be registered with central bank

if FX will be sourced from any authorised agent banks in case of repatriation of FX equivalent for any future peso sale proceeds or peso interest income. In Singapore, credit facilities exceeding SGD$5 million to non-resident financial entities for speculation purposes are not allowed. Overdraft to non-residents is not allowed either. In Thailand, overdraft facilities provided by domestic financial institutions to foreign investors are capped at THB30 million per non-resident investor per financial institution.

Though these issues may not have a direct impact on bond transaction flows, there is a need for foreign exchange advice and confirmation. When buyer is paying with local currency of relatively low convertibility, some additional bond transaction flows such as pre-funding and foreign exchange confirmation are necessary. In China and Viet Nam, pre-funding is required to secure sufficient funds in domestic custodians (cash correspondents) of the buyer before the foreign institutional investor effects trade order to the broker. In China, domestic custodian of a qualified foreign institutional investor (QFII) sends a cash-projection report to the designated QFII broker. In Viet Nam, foreign institutional investors send foreign exchange funding instructions to global custodians. Then, the global custodians send the instructions to domestic custodians to pre-fund cash before trade orders are sent from the investors to the global brokers. In Indonesia, Korea, Malaysia, the Philippines, and Thailand domestic custodians send the foreign exchange confirmation to global custodians to secure cash settlements at the central bank current accounts for DVP transactions.

5.3.3 Market Access

In China, only QFIIs are allowed access to the market.[8] In Korea, foreign investors must obtain an investment registration certificate (IRC). The IRC contains a unique identification number, which codes the investor's nationality and other information. In Viet Nam, non-resident investors must obtain a securities trading code. This code is used to monitor foreign ownership limits in the market by the Viet Nam Securities Depository (VSD). However, these issues do not have a direct impact on bond transaction flows in each country.

5.3.4 Messaging Standard

Messages between global custodians and domestic custodians are already standardized using ISO 15022 (or SWIFT message), except in a few countries. Also, messages between global brokers and domestic brokers are already standardized using Financial Information Exchange (FIX) protocol, which are expected to migrate to ISO 20022 in due course. Therefore, messages used for cross-border transactions are expected to be harmonized using ISO 20022.

5.3.5 Manual Pre-Settlement Matching

In Indonesia, Malaysia, the Philippines, Singapore, and Thailand, domestic custodians conduct pre-settlement matching with counterparties manually, using telephones and/or facsimiles. The main purpose of pre-settlement matching is to inform global custodians of the status of the pre-settlement matching during the previous settlement day (SD-1).

Matching used by local bond infrastructures for settlement matching will be discussed in Chapter 6.

8 China may open its OTC market (inter-bank bond market) since the People's Bank of China (PBOC) has published a notice in August 2010 on relevant issues in relation to renminbi investments by three types of institutions in the inter-bank bond market in the PRC on a pilot basis.

5.3.6 Securities Numbering

Global and local custodians use the international securities identification number (ISIN) as the standard securities numbering for cross-border bond transactions. ISIN in each market is discussed in Section 8.2.

5.3.7 Settlement Cycle

Settlement cycle for cross-border bond transactions vary from market player to another. Settlement cycles in each market are discussed in Chapter 7.

6. Matching

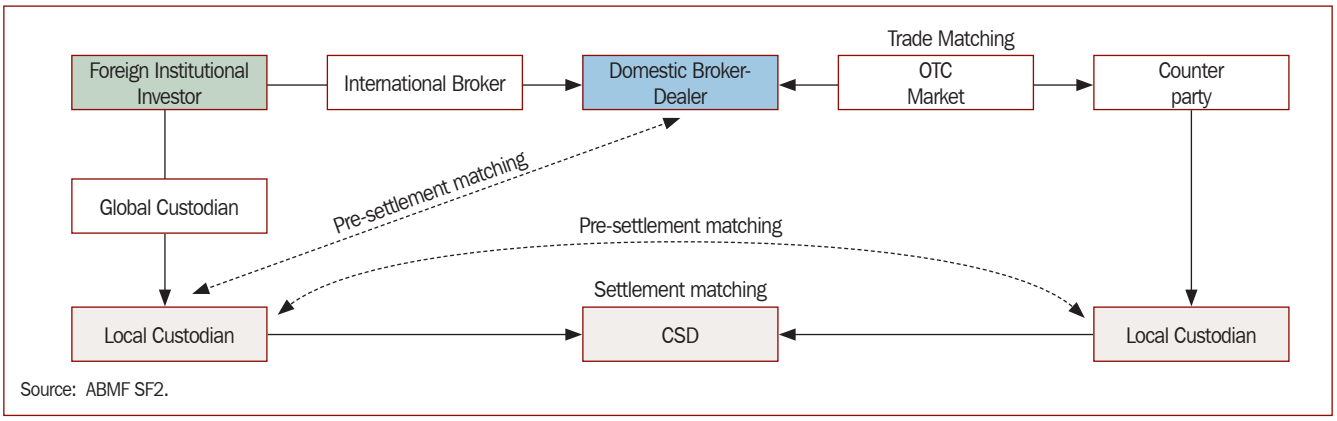
6.1 Matching Categorization

6.1.1 Trade Matching and Settlement Matching

There are several matching types such as trade matching and settlement matching.

The following diagram illustrates the trade matching and settlement matching processes.

Figure 6.1 Trade Matching and Settlement Matching Processes



Source: ABMF SF2.

Definition and interpretation of the various processes differ from person to person or from one organization to another. Below are the definitions adopted in this report.

1. **Trade matching and post-trade matching.**
   Details of the trade are compared between counterparties, mainly between local brokers, to ensure that there is no misunderstanding of the terms of the trade. This should be performed as soon as after the trade is executed, and in any event before the end of the business day. With automated trading systems (e.g., exchange systems or electronic OTC systems) matching is done at the time of trade, so there is no need for subsequent trade matching. However, many bond trades are still done through telephone or facsimile.
2. **Settlement matching and Pre-settlement matching**
   Settlement matching is done when bond settlement transactions are entered from both seller and buyer (local custodians) into the CSD to settle the bond transaction.

- In some countries, pre-settlement matching is carried out before settlement matching. Details of the agreed trade are compared between the counterparties' settlement agents (e.g., local custodian and local broker) to ensure that all information needed for settlement is in place. Generally, pre-settlement matching does not bind counterparties as is done in matching. Pre-settlement matching is done for local custodian to send pre-settlement matching status to global custodian prior to the day when settlement matching is performed.

6.1.2 Central Matching and Local Matching

The process of matching, particularly settlement matching, is categorized into two types: central matching and local matching.

1. **Central matching**
   Both of market participants (seller and buyer) or trading systems send the trade data to the CSD. Then, the CSD matches the data and sends back the matching confirmation to the seller and buyer.
2. **Local matching**
   One side of the bond settlement, either a seller or a buyer, inputs the trade data to the CSD, and the CSD forwards the data to the counterparty (the other seller or buyer). The counterparty checks the data and send back affirmation to the CSD, if the data is deemed as acceptable.

6.2 Matching in Each Market in ASEAN+3

This sub-section discusses trade matching, pre-settlement matching, and settlement matching, as well as central or local matching, for government bond transactions. The trade system with trade-matching function is available in the market, and there is no need for pre-settlement matching since same-day affirmation can be done through the trade system. Results can be reported to global custodians as well as the authorities, which request reporting from the market participants.

The matching types for government bond transactions in each market in ASEAN+3 are listed in Table 6.1 below.

Table 6.1 Matching Types in ASEAN+3 Markets

	Trade Matching	Pre-Settlement Matching	Settlement Matching
PRC	CFETS	–	Central/Local
HKG	CMU		Central/Local
INO	–	Telephone, facsimile, etc.	Central
JPN	PSMS	PSMS	Local
KOR	B-TRis	–	Central/Local
MAL	(BMS ETP)	RENTAS	Local
PHI	FI trading system/RoSS	Telephone, facsimile, etc.	Central/Local
SIN	–	PTI, Telephone, etc.	Local
THA	–	Telephone, facsimile, etc.	Central
VIE	HNX		Central

B-TRis = Bond-Trade Report and Information Service; BMS ETP = Bursa Malaysia Securities Electronic Trading Platform; CFETS = China Foreign Exchange Trade System; CMU = Central Moneymarkets Unit; HNX = Hanoi Stock Exchange; PSMS = Pre-Settlement Matching System; PTI = Post-Trade Integration; RENTAS = Real-time Electronic Transfer of Funds and Securities
– = no information.
Source: ABMF SF2.

Trade matching or post-trade matching by trade system is available for government bond OTC markets in People's Republic of China (PRC); Hong Kong, China; Republic of Korea; Malaysia; the Philippines; and Viet Nam. Pre-settlement matching is provided manually using telephone and facsimile in Indonesia, the Philippines, Singapore, and Thailand. In Japan, pre-settlement matching is done automatically through the pre-settlement matching system (PSMS). With respect to pre-settlement matching, local custodians confirms the quality of trade data by conducting pre-settlement matching with counterparty domestic brokers on the previous day of the settlement, and reports the matching status to global custodians to secure smooth settlement on settlement day. The pre-settlement matching process may better be provided automatically by trade system as post-trade matching facility or by the CSD as part of a post-dated transaction. If the CSD provides a post-dated entry, local custodians can input the trade data with the post-dated transaction and utilize the settlement-matching function for pre-settlement purposes.

Settlement matching for government bond markets in Indonesia, Thailand, and Viet Nam fall under central matching. On the other hand, settlement-matching processes for the bond markets in Japan, Malaysia, and Singapore adopt local matching. Settlement matching in People's Republic of China (PRC); Hong Kong, China; Republic of Korea; and the Philippines can be both through central and local matching.

7. Settlement Cycles and Operating Hours

7.1 Settlement Cycles in ASEAN+3

The settlement cycles of government bond transactions vary from T+1 to T+30 in ASEAN+3. Settlement cycles are not stipulated by regulations or law, but are mainly determined by negotiation based on proprietary business practices of market participants and restrictions of payment infrastructures, etc.

Table 7.1 illustrates typical settlement cycles of domestic and cross-border transactions in ASEAN+3.

Table 7.1 Settlement Cycles in ASEAN+3
(based on each market practice and definitions)

	Domestic	Cross-Border
PRC	T+0/T+1	T+1
HKG	T+0/T+1/T+2 (negotiable)	T+0/T+1/T+2 (negotiable)
INO	T+2	T+2 (negotiable)
JPN	T+3, T+2 (from April 2012)	T+2 - T+4
KOR	T+1 T+1 - T+30 (negotiable)	T+1 - T+3 with T+1 for Government Bond traded on KRX stock market division
MAL	T+1/T+2	T+2 (negotiable) for unlisted and T+3 for listed bonds
PHI	T+1[1]	T+1, T+3 (most prevailing)
SIN	T+1 but commonly contracted at T+3	T+1 to T+3 (negotiable) for unlisted and T+3 for listed bonds
THA	T+2	T+2 (negotiable)
VIE	T+1 - T+3	T+1 to T+3 (Hanoi STC) and T+1 for HCMC STC

[1] Market convention for domestic bond transactions is T+1, parties can still agree on T+0 basis.
Source: ABMF SF2.

The settlement cycles of domestic bond transactions in PRC, Republic of Korea, and the Philippines are T+1, which is shorter than that of other markets. In these markets, the trading system is directly linked with the CSD, and transmitting trade data to the CSD uses an online network. This STP may contribute to shorten the settlement cycles in the markets.

Although the cycle in Viet Nam is generally regarded as T+1, the definition of T in Viet Nam is not trade date but the date when trade data is entered to the trade system of the Hanoi Stock Exchange (HNX). Before entering the trade data into the system, an actual trade agreement should be made between a seller and buyer in the OTC market. The settlement cycle based on the trade date generally accepted in ASEAN+3 is T+2 or T+3 in Viet Nam.

7.2 Settlement Cycle as a Market Rule

In general, the settlement cycle is a common rule in the market. The rule may not be stipulated in regulation or law but should be observed by market participants. For example, if the settlement cycle of government bond trades in a market is T+3, investors must settle their government bond transactions in 3 business days. This means that when you buy government bonds, the broker must receive your payment no later than 3 business days after the trade is executed. When you sell a government bond, you must deliver to your broker your bond no later than 3 days after the sale.[9]

As such, the settlement cycle of the market means that majority of market participants need to follow the practice as a rule. Having said that, there is no such a rule in ASEAN+3, or even in each market, except for some markets. It will be beneficial for all market participants to have a common settlement cycle in ASEAN+3.

Some markets are trying to shorten their settlement cycles. The purpose of shortening the settlement cycles of government bonds is mainly the reduction of settlement risks, and the stabilization and activation of short-term financial markets. Unsettled bonds are exposed to settlement risks, and if a settlement cycle is longer, more unsettled positions are accumulated. The purposes of shortening the settlement cycles are listed below.

1) Reduction of settlement risks
   - Eliminating the risks of not receiving securities or cash on schedule
   - Reduction of the size and cost of fund raising associated with a counterparty's default
   - Mitigating replacement risks
   - Preventing the degree of chain of settlement failures

2) Stabilization and activation of short-term financial markets
   - Opportunities for raising funds and managing liquidity.
   - Mitigating market malfunctioning by speeding up the replacement of unsettled positions and the resolution of settlement failures
   - Improving liquidity of government bonds to make these more attractive as financial products.

9 US Securities and Exchange Commission, modified by the author.

To shorten the settlement cycle in a market, STP facilities of related infrastructures, such as online connection between trade systems and CSDs, need to be implemented. At the same time, all market participants need to follow the rule by automating individual internal systems.

Considering the settlement cycle in ASEAN+3, there is no institutional framework to discuss such an issue among stakeholders in the region yet. Thus, it is imperative that an institutional framework be established to have common rules and processes on settlement cycle in the region.

7.3 Operating Hours

Having a common settlement cycle in ASEAN+3 will be related to operating hours in each market, particularly the cut-off time in the market. Operating hours and cut-off time for DVP transactions in each market from system infrastructure's point of view is shown in Table 7.2.[10]

Table 7.2 Operating Hours in ASEAN+3

	CSD	Operating Hour (ASEAN time)	
		Open	Cut off time
PRC	CCDC CSDCC	– –	– –
HKG	CMU	8:30 (7:30)	18:30 (17:30)
INO	BI	6:30 (6:30)	19:00 (19:00)
JPN	BOJ JASDEC	9:00 (7:00) 9:00 (7:00)	16:30 (14:30) 17:00 (15:00)
KOR	KSD	9:00 (7:00)	17:00 (15:00)
MAL	MyClear	–	–
PHI	BTr-RoSS PDTC	9:30 (8:30) 8:00 (7:00)	15:30 (14:30) 18:00 (17:00)
SIN	MAS	–	–
THA	TSD	–	–
VIE	VSD	–	–

– = no information.
Source: ABMF SF2.

ASEAN Time refers to Jakarta time where the ASEAN secretariat is located, and is used for reference purposes only.

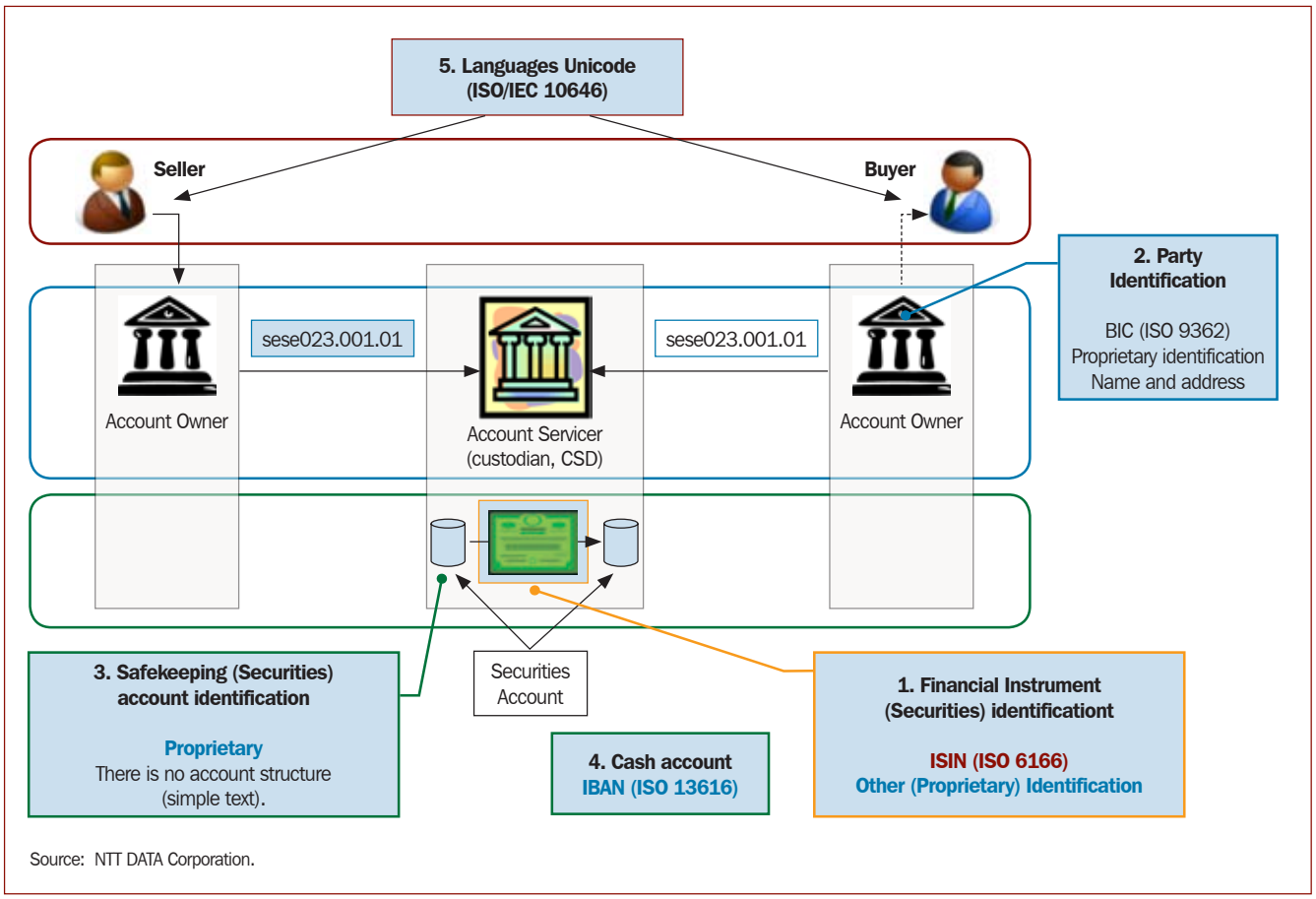
8. Standards on Numbering and Coding

8.1 General

It is important to standardize numbering and coding to promote STP of bond settlement. Numbering and codes related to bond transaction flows are: (1) financial instrument identification, (2) party identification, (3) safekeeping account, and (4) language and character code set. The language and character code set are discussed as follows.

[10] In some cases, cut off time from market rule may be earlier.

Figure 8.1 Standard of Numbering and Coding



Source: NTT DATA Corporation.

The following table illustrates the numbers and codes adopted in each market in ASEAN+3.

Table 8.1 Numbers and Codes in ASEAN+3 Markets

	Market	Securities Numbering	Financial Institution Identification	Securities Account	Cash Account	Encoding Scheme and Language
PRC	OTC	Proprietary code	Proprietary code	Proprietary code	Proprietary code	UNICODE (UTF 8)
HKG	OTC	ISIN and proprietary code (CMU issue)	Proprietary code	Proprietary code	Proprietary code	Code supported by SWIFT
INO	OTC	ISIN and proprietary code	BIC and proprietary code	Proprietary code	Proprietary code	–
JPN	OTC	Proprietary code	BIC and proprietary code	Proprietary code	Proprietary code	UNICODE (UTF 8)
KOR	OTC	ISIN and proprietary code	Proprietary code (account number)		Proprietary code	• KSC5601 for Korean
MAL	OTC	–	–	–	–	–
PHI	OTC	ISIN and proprietary code for Government Securities	Proprietary code (PDS-assigned firm)	Proprietary code	Proprietary code	UNICODE (UTF 8)
SIN	OTC	–	–	–	–	UNICODE (UTF 8)
THA	OTC	ISIN	BIC	Proprietary code	Proprietary code	UNICODE (UTF 8)
VIE	OTC	ISIN and proprietary code	N/A	Proprietary code	N/A	UNICODE (UTF 8)

BIC = Business Identifier Code; ISIN = International Securities Identification Number; OTC = over-the-counter
– = No information.
Source: ABMF SF2.

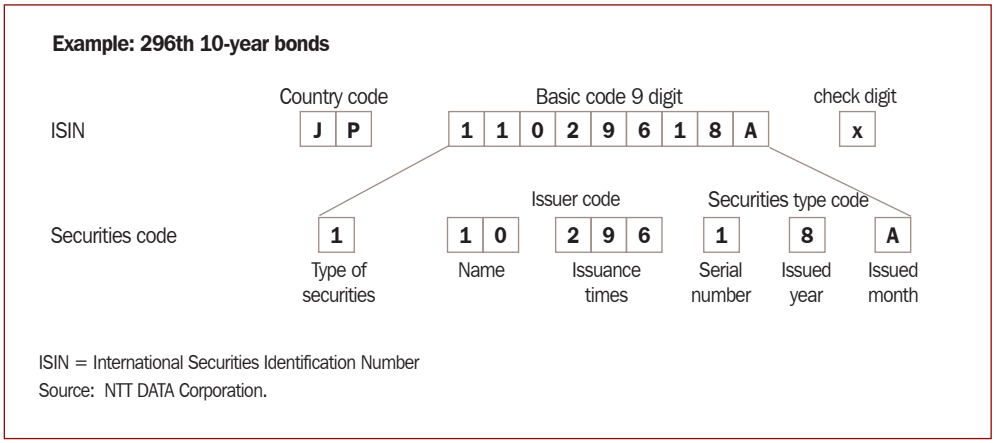
8.2 Securities Numbering

8.2.1 International Securities Identification Number (ISIN)

One of the most important numbering of bond settlements is the International Securities Identification Number (ISIN). ISIN is adopted by all economies, except China. In reality, however, proprietary securities numbering is used instead of ISIN in most ASEAN+3 economies.

ISIN, as defined in ISO 6166, uniquely identifies securities including bonds. ISIN is a 12-character alphanumerical numbering that does not contain information characterizing financial instruments, but serves for uniform identification of securities at trading and settlement. Figure 8.2 illustrates the ISIN code structure of Japanese government bonds. Conversion is also possible between proprietary numbering and ISIN.

Figure 8.2 ISIN Code Structure of Government Bonds (example)



ISIN = International Securities Identification Number
Source: NTT DATA Corporation.

8.2.2 Association of National Numbering Agencies

Table 8.2 ANNA Members in ASEAN+3

	Full Member
PRC	China Securities Regulatory Commission
HKG	Hong Kong Exchanges and Clearing Ltd.
INO	PT Kustodian Sentral Efek Indonesia (Indonesian Central Securities Depository)
JPN	Tokyo Stock Exchange
KOR	Korea Exchange (KRX)
MAL	Bursa Malaysia
PHI	Philippine Stock Exchange, Inc.
SIN	Singapore Exchange Limited
THA	Thailand Securities Depository
VIE	Vietnam Securities Depository

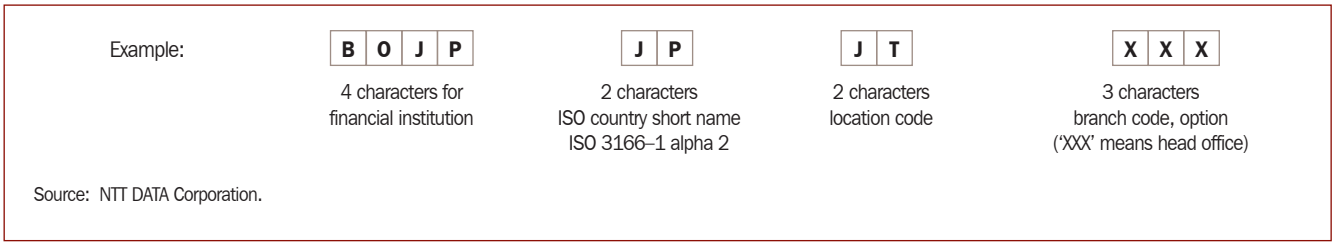
Source: ABMF SF2.

All ASEAN+3 economies that have bond markets are full members of the Association of National Numbering Agencies (ANNA). ANNA and national numbering agencies (NNAs) allocate ISIN in accordance with ISO 6166. However, actual securities numbers are based on domestic proprietary numbering in many markets for the time being. It will be important to promote ISIN in ASEAN+3.

8.3 Party Identification and Account

The Business Identifier Code (BIC) is a unique identification code for both financial and non-financial institutions. Its structure is defined in ISO 9362. BIC is an 8- or 11-digit code, which indicates the financial institution with the last 3 digits as an option for branch code. It is used to identify each financial institution including branch. Figure 8.3 illustrates the code structure of ISO 9362.

Figure 8.3 Code Structure of ISO 9362



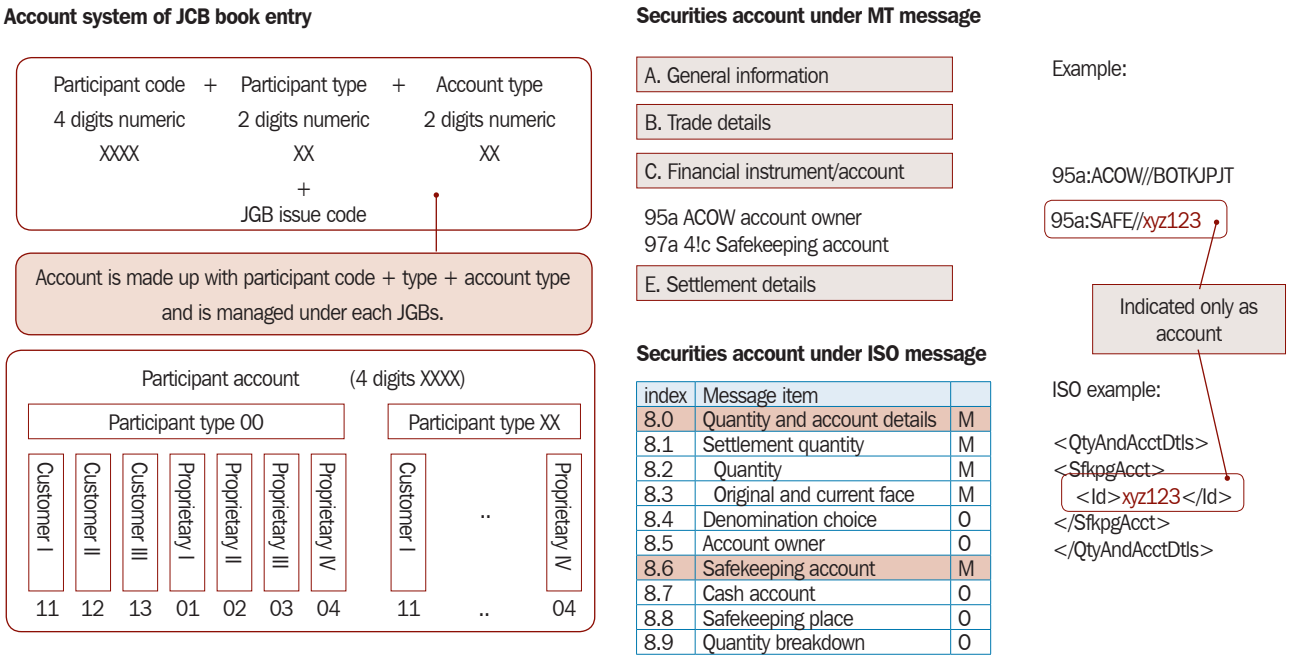
Source: NTT DATA Corporation.

Some ASEAN+3 economies, such as Indonesia, Japan, and Thailand, have adopted the BIC for financial-institution identification, and Indonesia and Japan also use proprietary codes. Other economies continue to use proprietary coding only. It will be important to promote BIC as an identifier of banks and financial institutions including broker-dealers and custodians in harmonizing numbering and coding in ASEAN+3.

8.4 Safekeeping (Securities) Account Identification

All markets in ASEAN+3 use proprietary numbering for safekeeping accounts. There is currently no code structure for securities numbering as defined in ISO 20022. Safekeeping account identification is defined as text format with a maximum of 35 texts. Figure 8.4 is an example of a securities account. Because code structures of securities accounts are influenced by the taxation structure of each country, it will be a great challenge to standardize safekeeping account structure and numbering in the region; thus, there is also a need to harmonize the tax structure for non-residents before account structures can be standardized. When discussing standardization of safekeeping account, standardization of cash account is also taken into consideration.

Figure 8.4 Safekeeping Account (example)



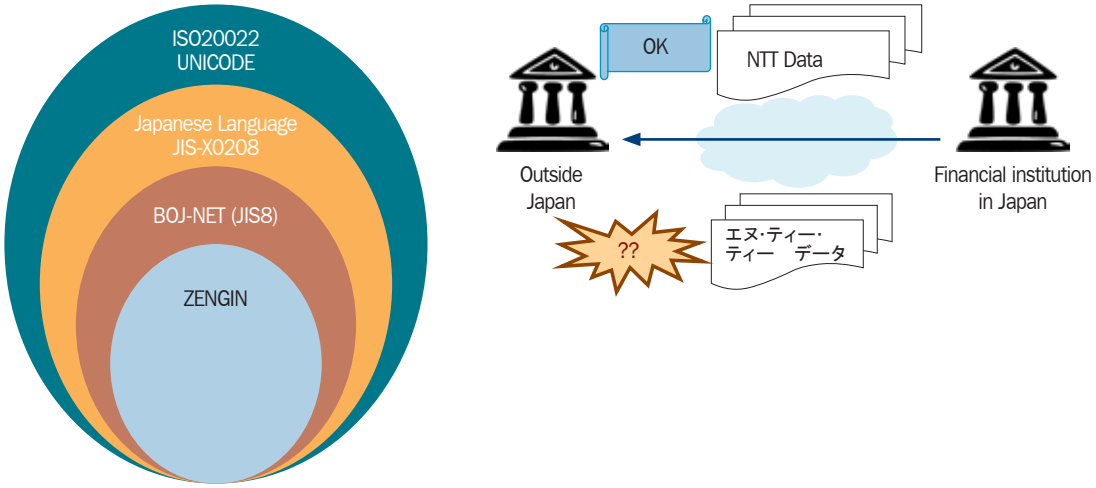
index	Message item	
8.0	Quantity and account details	M
8.1	Settlement quantity	M
8.2	Quantity	M
8.3	Original and current face	M
8.4	Denomination choice	O
8.5	Account owner	O
8.6	Safekeeping account	M
8.7	Cash account	O
8.8	Safekeeping place	O
8.9	Quantity breakdown	O

Source: NTT DATA Corporation.

8.5 Character Code and Language

All CSDs in ASEAN+3 with bond markets accept UTF-8. In general, all CSDs use their own languages for day-to-day businesses except, in Hong Kong, the Philippines, and Singapore. Therefore, a standard language for bond settlement systems is a challenge in the region. Figure 8.5 shows an example of character code and language.

Figure 8.5 Sample Character Code and Language in ASEAN+3



Source: NTT DATA Corporation.

9. Possible Next Steps

9.1 Overview of Possible Next Steps for the ASEAN+3 Bond Market Forum SF2

The following next steps are the proposed for the ASEAN+3 Bond Market Forum (ABMF) Sub-Forum (SF2).

1) Continue the survey of bond transaction flows, messaging and market practices
2) Continue ISO 20022 fit-and-gap analysis for government bonds DVP transaction
3) Propose a roadmap to standardize and harmonize bond markets in ASEAN+3

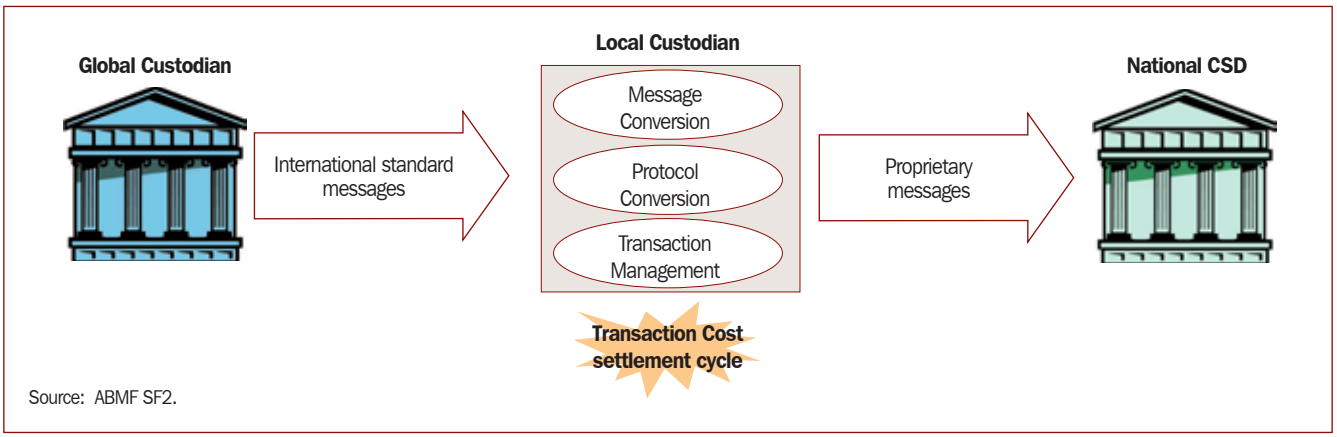
ABMF SF2 envisions that the possible steps listed above will accomplish its purposes. The forum sees it fit to continue the identification of transaction flows, messaging and market practices by expanding its scope from government bonds DVP transactions. The scope of the survey will be expanded to issuance, interest payment, and redemption of government bonds. Possible cross-border DVP transaction flow will also be included in the survey. Some basic trades of corporate bonds including some corporate practices will be surveyed, as well. In addition, SF2 will collect information on Legal Entity Identifier (LEI)[11] and improvements in trade data collection in ASEAN+3. Fundamental surveys of government bond transactions, including fit-and-gap analysis of message items of settlement instruction and confirmation of government bonds DVP transaction, will continue to be conducted to find possible solutions for cross-border STP of bond transactions. A discussion on the roadmap to implement STP in ASEAN+3 can be found in the succeeding subsection.

9.2 Scope of Fit-and-Gap Analysis

Bond transaction messages between global custodians and local custodians are already standardized since SWIFT messages are used. Bond trades and transactions between brokers and custodians who are doing businesses globally and internationally are already based on international standards, as well. Also, adopting international standards for messages among global players is under the discretion of each player. Therefore, standardization of messages among international players is not the focus of ABMF SF2. However, if messages of domestic bond settlement infrastructures such as CSD remain proprietary, local custodians need to convert external messages to proprietary one to fit local standards, which increases the cost of transaction processing in the region. Therefore, standardization of domestic flows will significantly contribute to enhance interoperability and STP of cross-border transactions in the region.

[11] A Legal Entity Identifier (LEI) is a unique ID associated with a single corporate entity. Although no common entity ID convention exists in the market today, a range of regulatory initiatives are driving the creation of universal LEI standard for financial markets.

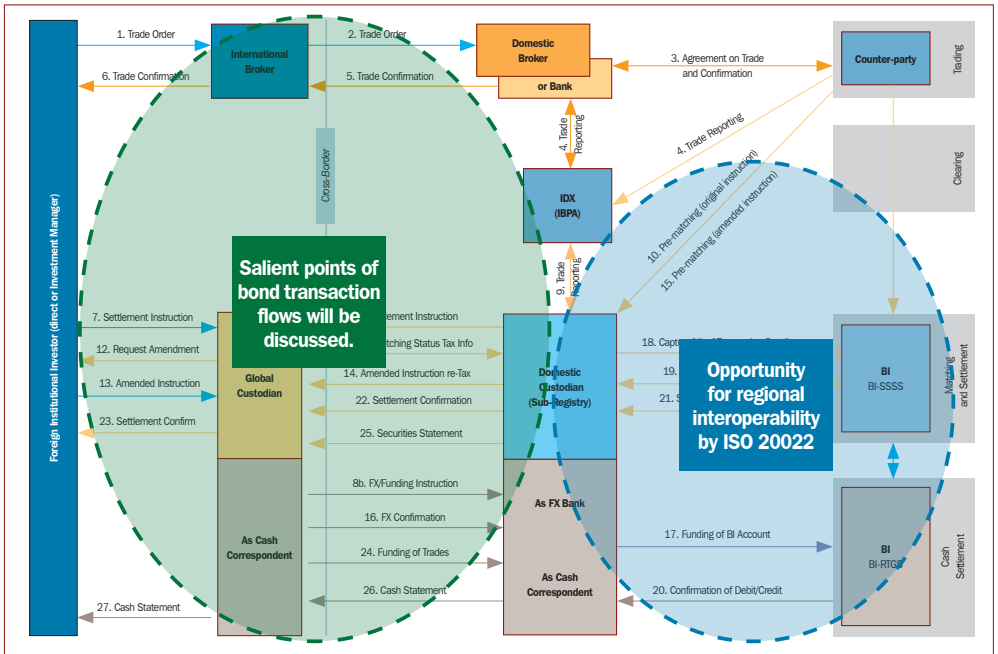
Figure 9.1 Conversion at Local Custodian



Source: ABMF SF2.

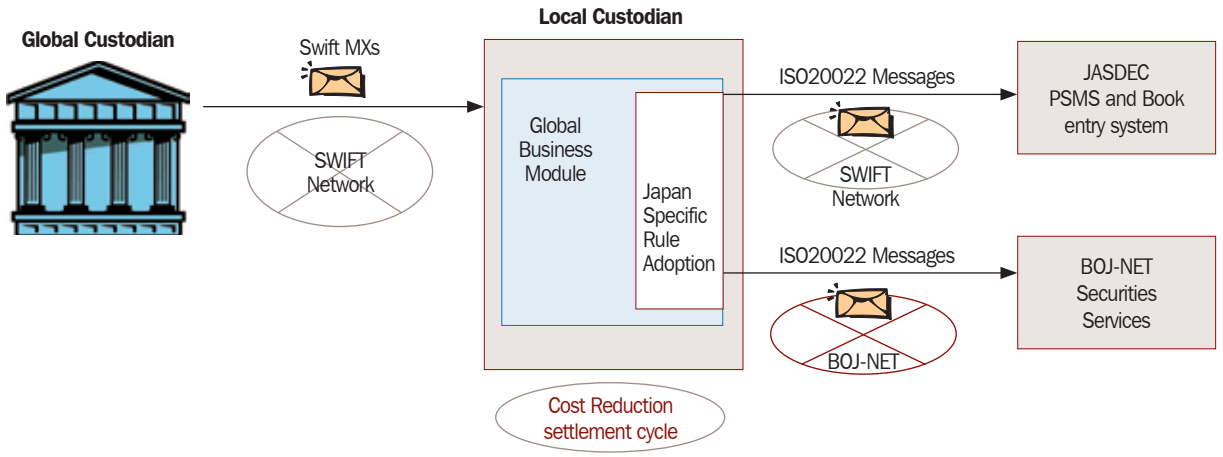
In other words, if the messages of domestic infrastructures become compatible with the international standard, opportunities for regional interoperability will be enhanced. An image of the scope is illustrated in Figure 9.2. More specifically, the adoption of ISO 20022 frameworks will help reduce the cost of local custodians by streamlining the processes to convert messages from international standards to local practices among local custodians. This is illustrated in Figure 9.3.

Figure 9.2 Scope of Standardization



Source: ABMF SF2.

Figure 9.3 No Conversion

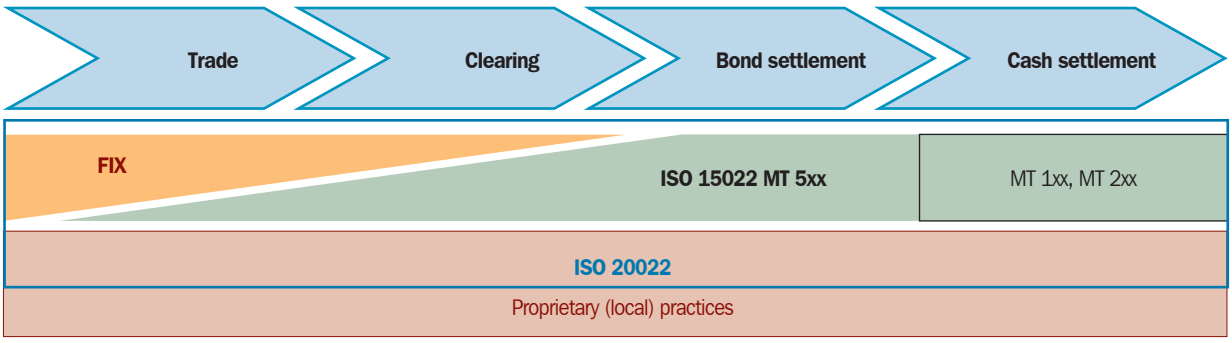


Source: ABMF SF2.

Therefore, a fit-and-gap analysis of ISO standards and local practices of domestic bond transaction will be carried out.

To examine conformity with ISO20022, business processes such as message transactions themselves and message flows need to be surveyed. In some cases, MT (ISO 15022) to MX (ISO 20022) reverse engineering may be required. ISO 20022 includes the processes from trading to bond and cash settlement. Considering the survey on DVP transactions conducted by SF2, a fit-and-gap analysis of ISO 20022 related to bond settlement (MT5xx of ISO 15022) will focus on specific targets of messages for the next step.

Figure 9.4 Mapping ISO20022 with Conventional Local Standard



FIX: The Financial Information eXchange (FIX) protocol is an electronic communications protocol initiated in 1992 for international real-time exchange of information related to the securities transactions and markets.
ISO 15022: ISO 15022 is an ISO standard for messaging used in securities trading such as MT541 and MT543 for RVP and DVP of securities.
ISO 20022: ISO 20022 or UNIFI is the ISO Standard for Financial Services Messaging such as sese 023.001.01 for securities settlement instructions.

Source: ABMF SF2.

A fit-and-gap analysis of terminologies will also be conducted.

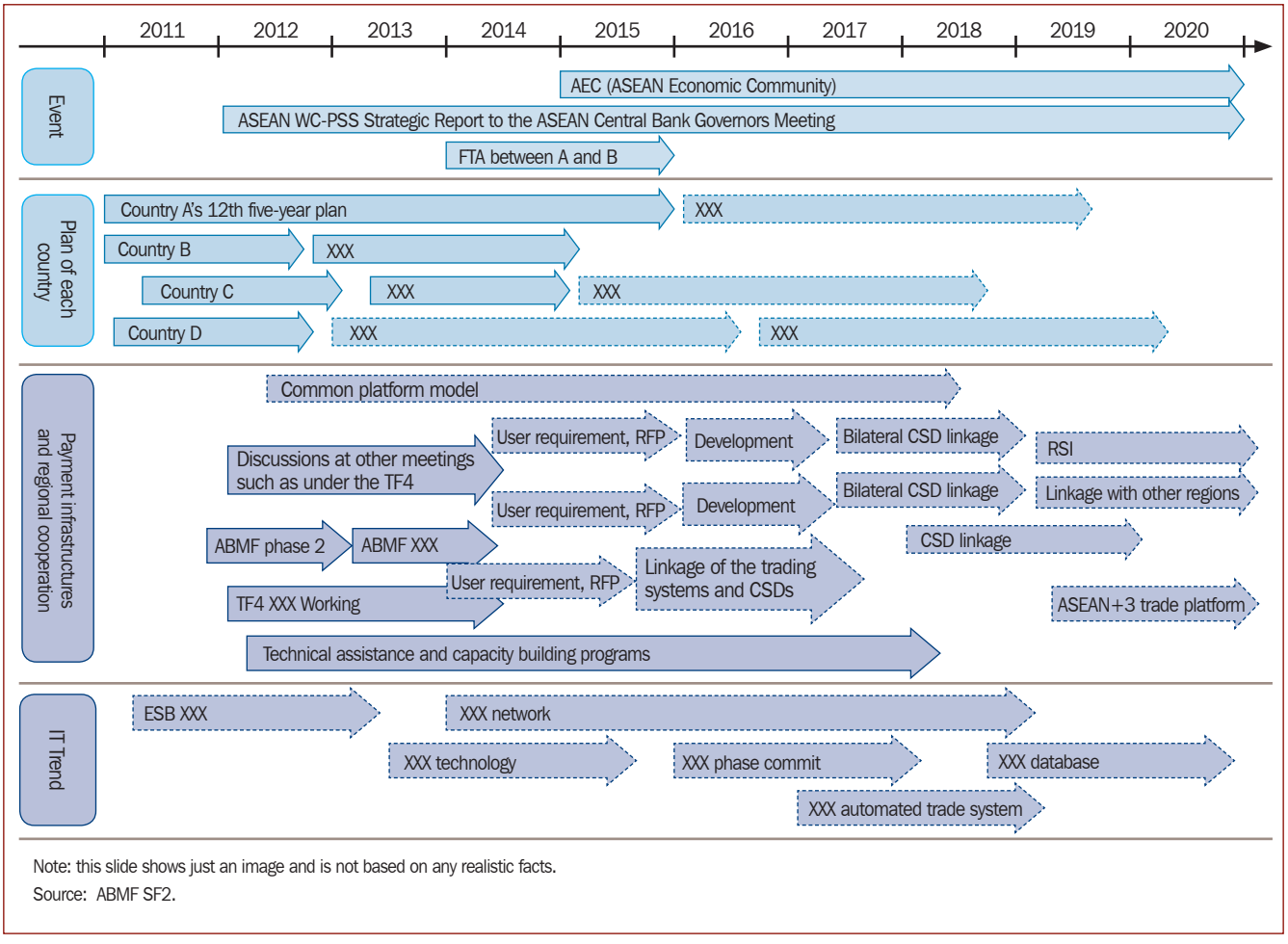
9.3 Drafting Roadmaps

Based on the survey results, STP and standardization of cross-border bond transactions in ASEAN+3 are possible points of discussion in subsequent initiatives of SF2. Some possible roadmaps and scenarios to make STP of cross-border bond transactions a reality in the region may be proposed.

Major events in the ASEAN+3 such as the ASEAN Economic Community (AEC), which could have an impact on bond trades and settlement flows, need to be identified and scheduled. Medium- to long-term plans of member countries and economies also need to be shared and organized. Possible future modes of payment infrastructures also have to be discussed with due consideration given to related events and medium- to long-term plans of member countries and economies. Institutional framework to implement such roadmaps will also be considered. Plausible legal and regulatory framework such as tax-related issues will also be discussed.

Trends in breakthroughs in information technology will also be considered in the proposed road map. All these may be put in a sheet and discussed among members and experts to share possible future images of bond trade and settlement market infrastructures. A draft image of a roadmap is illustrated here.

Figure 9.5 Roadmap (Master Plan) Image

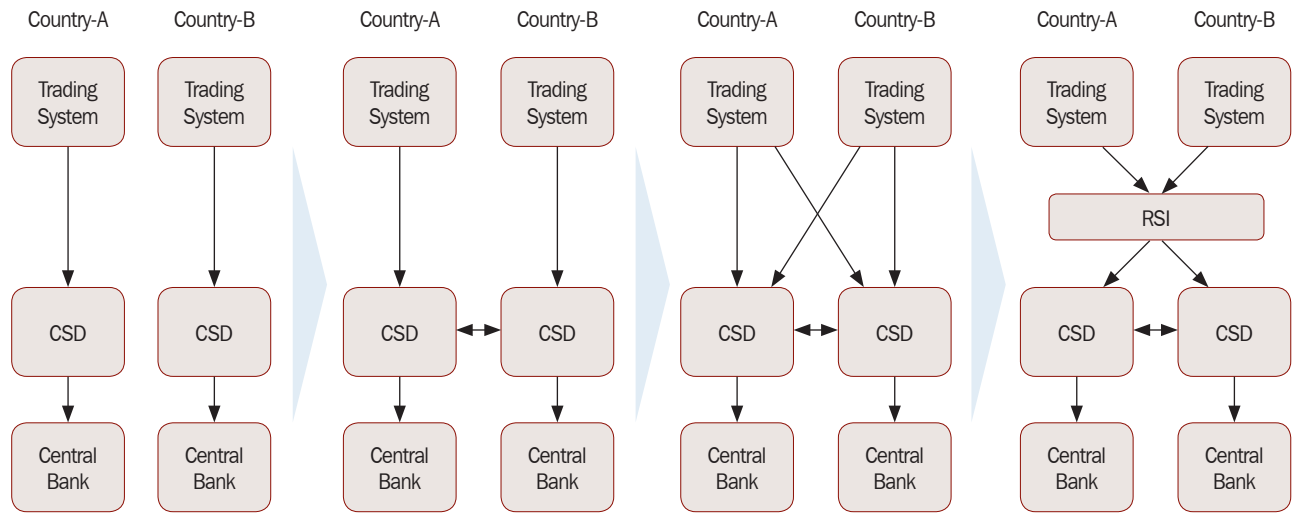


Note: this slide shows just an image and is not based on any realistic facts.
Source: ABMF SF2.

Some possible goals of the roadmap can include:

1) Establishing bilateral connections between countries with existing bond-market infrastructures, as a first step to develop STP of cross-border transactions; and
2) Other insights that may be generated from the survey results, as well as discussions of TF4 on regional settlement intermediaries.

Figure 9.6 Future Image of Regional Settlement Intermediaries

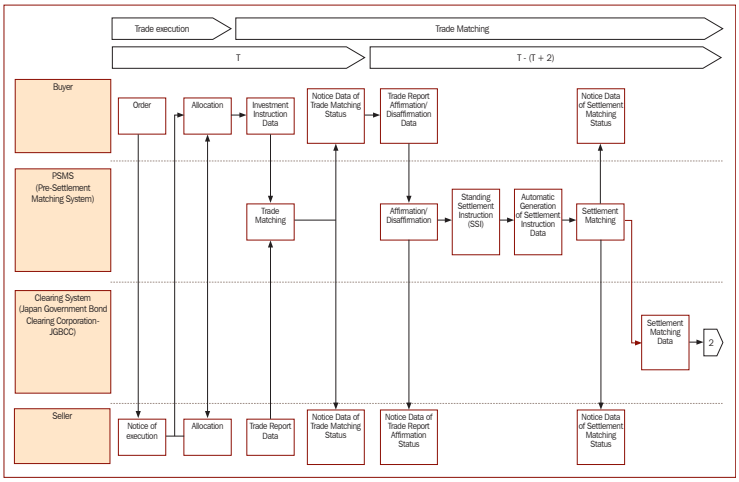


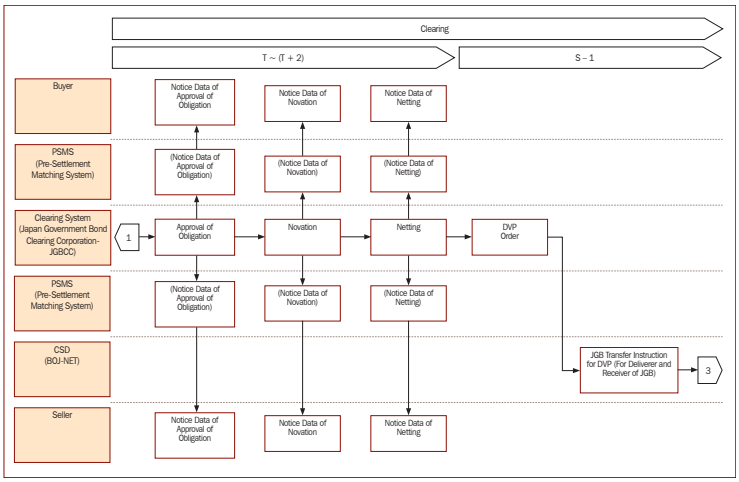
Source: ABMF SF2.

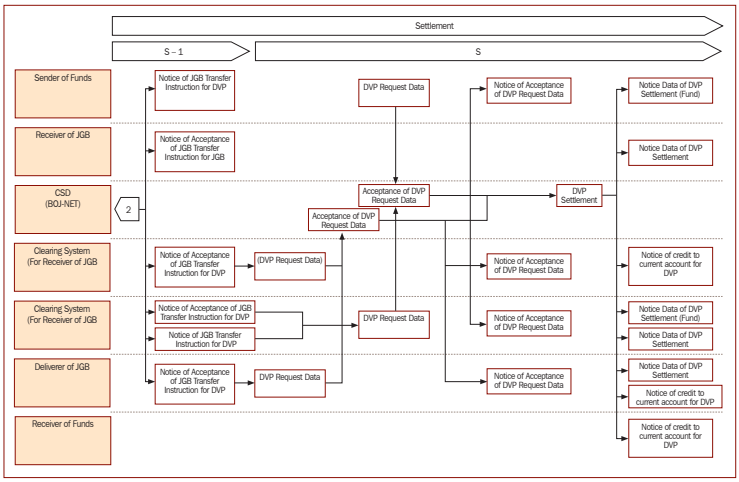
9.4 Detailed Government Bond Transaction Flow

Depending on future discussions and results of the fit-and-gap analysis, further details of government bond transaction flow may be considered for markets that have the possibility of establishing bilateral connections as a pilot study. The following is a proposed detailed flow for DVP transaction.

Figure 9.7 Example of Detailed Bond Transaction Flow







Note: The diagram is just an image and does not reflect the exact transaction flow in the Japanese market.

Source: ABMF SF2.

9.5 Technical Assistance

It is important for ASEAN+3 bond markets to achieve a level of equivalence if the region is to develop deep, liquid, efficient and effective bond markets to consolidate investments within the region, and have these investments revolve within the region. Therefore, it will be imperative to support countries, which are planning and developing bond market infrastructures that are interoperable with other bond market infrastructures in the region. From this viewpoint, mutual cooperation between the member countries and economies in the region, including technical assistance, will be one of the important issues of the ABMF SF2.

10. Conclusion

ABMF SF2 surveyed government bond trade and settlement procedures from the viewpoint of cross-border STP. As a result of the survey, SF2 clarified the typical business flows of domestic and cross-border government bond transactions, as well as trade, clearing, and settlement infrastructures. SF2 also shared information on the adoption of standards such as ISIN, BIC, securities account, language code, and communication protocols. According to survey results, ASEAN+3 economies have robust and sound bond infrastructures, and continue to improve their infrastructures with technical innovations. Through discussions during SF2 meetings, countries that do not have bond markets and corresponding infrastructures acknowledge the importance of the acceptance of common standards on bond market infrastructures. The survey demonstrated that infrastructures for cross-border bond transactions are undeveloped within the region at present.

SF2 concludes that the next phase of the sub-forum will discuss the interoperability of bond transactions through the standardization of trade and settlement systems, and cross-border DVP to mobilize regional savings for regional investments. Based on the survey of flowcharts of government bond transactions in each market, the next phase of SF2 will perform four major tasks:

a) fit-and-gap analysis of flows and messaging;
b) clarifying issuance, interest payment, and redemption procedures of government bonds;
c) basic survey about corporate bonds, and
d) a roadmap about the future of ASEAN+3 bond markets.

Through these activities, human interaction will be facilitated and these relationships will help the development of cross-border bond transactions.

Finally, this report is envisioned to shed light on facilitating the development of more efficient and more liquid ASEAN+3 bond markets.

11. Acknowledgement

This report is a result of many efforts of individuals and various organizations.

Below is the list of organizations that convened the different ABMF meetings in their respective countries:

The Ministry of Finance of Japan hosted the 1st ABMF. The Asian Development Bank hosted the 2nd ABMF. Persatuan Permasaran Kewangan Malaysia, CIMB Group, and Suruhanjaya Sekuriti Malaysia hosted the 3rd ABMF. Korea Capital Market Institute, Korea Financial Investment Association, and Korea Securities Depository hosted the 4th ABMF. The Ministry of Finance of the Republic of Indonesia, the Indonesia Stock Exchange, PT Kliring Penjaminan Efek Indonesia, and PT Kustodian Sentral Efek Indonesia hosted the 5th ABMF. The People's Bank of China, China Central Depository and Clearing hosted the 6th ABMF.

In compiling this report, references were made to a number of publications by global custodians, including J.P. Morgan, State Street, Citigroup, Dexia, and Standard Chartered.

Valuable information, advice, and guidance have been provided by national members, national experts, international experts, and members of ABMF-Japan in particular Takeshi Kurihara and his team from the Ministry of Finance of Japan.

We have also received much information from central banks who are not members of the ABMF SF2, including Mr. Ronald Waas and his team of the Bank Indonesia; all related departments of the Bank of Japan; Mr. Jeon Beop Yong and his team of the Bank of Korea; Mr. Mohd Fairuz Hj Ahmad and his colleagues of Bank Negara Malaysia; Bangko Sentral ng Pilipinas; Ms. Dan Meng Chen of Monetary Authority of Singapore; Dr. Chim and his team from the Bank of Thailand, and Mr. Nguyen Toan Thang and his team at the State Bank of Viet Nam.

SF2 has obtained valuable information from presenters at the information sessions as shown in Appendix 4.

During the visit in ASEAN+3 economies, the entities visited shown in Appendix 5 kindly provided very valuable information to SF2.

The National ABMF, the first of which was established in Japan (ABMF-J), was led by Kazushi Iwai. The National ABMF in Korea and the Philippines were also established and contributed greatly to ABMF activities.

Valuable information was also provided to SF2 by entities during the visit in ASEAN+3 economies (see Appendix 5 for list of entities).

The ADB secretariat support staff,[12] editor,[13] and NTT DATA Group[14] helped the SF2 ADB consultant in completing this report.

The ADB secretariat and consultants for SF2 would like to express their heartfelt gratitude to all of the above for their kind assistance.

12 Raquel Borres, Sheila Sombillo, and Susan Monteagudo.
13 Zuraida Mae Villanueva
14 Takahiro Yanagisawa, Keiko Yoshida, Masahiro Nishihara, and Yosuke Yamada also assisted the ADB consultant of SF2.

Appendixes

Appendix 1

Questionnaire on Implementing Straight Through Processing
Draft prepared for the 2nd ASEAN+3 Bond Market Forum (ABMF) Sub-Forum 2 (SF2) on 14 December 2010, Manila

Introduction

a) This questionnaire is prepared for a baseline survey on message standardization and transaction cost aiming at implementing straight through processing (STP) in cross-border bond transactions between the countries of the Association of Southeast Asian Nations, the People's Republic of China, Japan, and the Republic of Korea (ASEAN+3) region.
b) This survey seeks to understand the bonds settlement infrastructures and business processes of government bond transactions in each country.
c) The survey for the bonds settlement infrastructures is to share essential information to implement STP such as the level of automation and dematerialization of bonds, as well as players in each country, since manual operations and proprietary processes could be the reason for the higher cross-border transaction cost in the region.
d) It is desirable for national members to answer the questionnaire for all central securities depositories (CSDs) of each country by collecting necessary information and compiling them with their best efforts. International experts are expected to answer the questions from the viewpoint of cross-border transactions.
e) Outcome of this baseline survey may provide global market players, such as custodians, with useful information for cross-border transactions to be processed more efficiently. The outcome may also provide the Asian Bond Market Initiative Taskforce 4 (ABMI TF4) with useful information for the further study to implement an infrastructure for cross-border transactions such as CSD linkage (i.e, regional settlement intermediary [RSI]).
f) If a new CSD system is already under development, the answer to the questionnaire is expected to be based on the requirements and the specifications of the new system as much as possible. Inclusion of development schedule is desirable.

g) When publishing the report of ABMF SF2, the report will be checked by all members beforehand. Therefore, any information and data, which are helpful for this survey, are appreciated.
h) It is desirable to update the "Market Comparison Matrices (for Bond), GoE Sub committee B, As of Feb. 9, 2009".

1. Bond market infrastructures

Describe the entities involved in bond trading, matching, clearing, and settlement together with the interrelationship between the bond settlement infrastructures.

1.1 Draw a diagram showing relationship between bond settlement infrastructures (e.g., CSD, central counterparty [CCP]) in each country.
1.2 Please clarify and explain the diagram.
1.3 Bond markets in each country or economy
  1.3.1 Name of the bond markets
  1.3.2 Owner and operator of the bond markets
  1.3.3 Name of networks (e.g., SWIFT) and communication protocols (e.g., Transmission Control Protocol/Internet Protocol [TCP/IP]) of the networks connected to the bond markets
1.4 Matching systems in each country or economy.
  1.4.1 Name of the matching systems
  1.4.2 Owner and operator of the matching systems
  1.4.3 Name of networks (e.g., SWIFT) and communication protocols (e.g., TCP/IP) of the networks connected to the matching systems
1.5 Clearing systems (CCPs) in each country or economy.
  1.5.1 Name of the clearing systems
  1.5.2 Owner and operator of the clearing systems
  1.5.3 Name of networks (e.g., SWIFT) and communication protocols (e.g., TCP/IP) of the networks connected to the clearing systems
1.6 Cash settlement systems (such as real-time gross settlement [RTGS] systems) in each country/economy.
  1.6.1 Name of the cash settlement systems
  1.6.2 Owner and operator of the cash settlement systems
  1.6.3 Name of networks (e.g., SWIFT) and communication protocols (e.g., TCP/IP) of the networks connected to the cash settlement systems
  1.6.4 Delivery versus payment (DVP) and Bank for International Settlements (BIS) model for each type of bond, if DVP is available.

BIS model

Model 1 - Systems that settle transfer instructions for both bond and funds on a trade-by-trade (gross) basis, with final (unconditional) transfer of bond from the seller to the buyer (delivery) occurring at the same time as final transfer of funds from the buyer to the seller (payment).

Model 2 - Systems that settle bond transfer instructions on a gross basis, with final transfer of bond from the seller to the buyer (delivery) occurring throughout the processing cycle, but settle funds transfer on a net basis, with final transfer of funds from the buyer to the seller (payment) occurring at the end of the processing cycle.

Model 3 - Systems that settle transfer instructions for both bond and funds on a net basis, with final transfers of both bond and funds occurring at the end of the processing cycle.

1.6.5 Please explain functions related to liquidity such as liquidity saving features and intraday overdraft.

2 Survey on CSDs in each country

If there are more than one CSD, could you answer the following questions for each CSD separately, please?

2.1 The name of the CSD.

2.2 The owner and operator of the CSD.

2.3 Types of Bond (e.g., government bond, investment fund, short-term bond, and corporate bond) supported by the CSD and the status of dematerialization of each type of bond.

2.4 The number of stakeholders for each category such as domestic banks, foreign banks, securities companies, etc. participating in the CSD.

2.5 List of all business transactions with brief explanation related to bond trade and settlement in each CSD.

2.6 The following items related to the networks used for each CSD.

2.6.1 Name of the networks (e.g., SWIFT)

2.6.2 Type of the line (e.g., leased line, Integrated Services Digital Network [ISDN], Internet, IP-Virtual Private Network [IP-VPN])

2.6.3 Communication protocol (e.g., TCP/IP)

2.6.4 Communication interface (e.g., MQ,[15] Common Object Request Broker Architecture [CORBA])

2.6.5 Message format (e.g., text, comma separated value [CSV], extensible markup language [XML])

2.6.6 System configuration, network configuration, and center configuration including contingency measures

2.7 Other CSDs and international central securities depositories (ICSDs) linked to the CSD. If there are different CSDs and/or ICSDs connected, please answer all of them with brief explanation.

3 Comparison of the typical business flowchart drawn based on the standard template.

- Harmonization of business processes of typical transactions is an essential matter to implement STP. Therefore, comparing typical business flowchart based on standard template is an important step to implement STP for cross-border bond transactions.
- A step-by-step approach will be taken. Firstly, business processes for typical government bond transactions such as free of payment (FOP) and DVP will be surveyed. Then, other transactions such as issuance, interest payment, and redemption may be covered. Also, bonds other than government bonds such as corporate bonds may be covered after this initial survey.

3.1 Drawing business flowchart of FOP and DVP as typical business processes in each country based on the template is desirable.

3.2 Drawing the business flowcharts of the typical processes for cross-border transactions based on the template is desirable. Cross-border transactions by nonresidents (inbound) and foreign bond transactions by residents (outbound) are expected to be covered by international experts. Please list all major (inbound and outbound) transaction types and choose the most typical transaction type among them with brief explanation.

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15 Message queue interconnects applications exchanging data, which are stored in queues to make next processes start without waiting completion of previous processes at interconnected applications (asynchronous communication).

3.3 Conducting preliminary fit-and-gap analyses of the typical business processes (not message format) with the ISO 20022 is desirable. Fit-and-gap analysis of definition of terminologies is also desirable.
- Regarding fit-and-gap analysis with ISO 20022, supplemental survey may be carried out during Phase 2 of SF2 considering the results of this survey.
- Harmonization of terminologies also needs to be carried out following the international standard during Phase 2.

3.4 If there are any other candidates as typical business processes to be analyzed, please list them up.
- Regarding additional business processes (such as issuance, interest payment, and redemption) other than FOP and DVP, supplemental survey may be carried out during Phase 2, considering the results of this survey.
- Transactions covering taxation of government bonds, such as interest payment for nonresidents, may be chosen as a candidate for the next step of survey after sharing the methodology through the initial survey.

4 Survey on matching

Survey on matching for typical business processes

4.1 What kind of matching is introduced (automated) for the typical business processes (FOP and DVP) in each CSD? Please refer to the reference "Pre-Settlement Matching System (PSMS). "

4.2 Please comment on the pros and cons of "one-sided (local)" and "two-sided (central)," or both for matching systems. What is the cost implication of the difference of matching?
- One-sided trade input matching is a way of entering business transactions from one side of the trade counterparties (for example, from the seller side). The entered transaction is sent to the buyer. The buyer checks the transaction and enters "OK" sign if it is correct, or enters "NG' if it is not correct. Two-sided trade is a transaction wherein both seller and buyer of the trade enter the transaction from both sides.

5 Survey on settlement cycles

Survey on the settlement cycles of typical business processes for both local and cross-border transactions

5.1 How long is the standard settlement cycle from trade in government bonds to settlement?

5.2 In case there are differences between settlement cycles of typical business processes (FOP and DVP transactions), what are the reasons for that?

5.3 The settlement cycles of cross-border transaction and local transaction are same?

5.4 If there is difference between the settlement cycles of cross-border and local transactions, how long is the cycle of these transactions? And what are the reasons for the differences?

5.5 If there is any initiative to shorten the settlement cycles, please describe it.

5.6 If there are target settlement cycles to be shortened, please describe them including target date to start them.

5.7 What are the background and reasons for the initiative concerning shortening the settlement cycle? What is cost implication of shortening of settlement cycle?

6 Survey on standards such as numbering and coding

a) Securities numbering: International Securities Identification Number (ISIN, ISO 6166
- ISIN defined in ISO 6166 uniquely identifies securities including bonds. The ISIN code is a 12-character alphanumerical code that does not contain information characterizing financial instruments but serves for uniform identification of securities at trading and settlement.

b) Financial institution identification: Business Identifier Code (BIC, ISO 9362)
- ISO 9362 specifies the elements and structure of a universal identifier code, the BIC, for financial and non-financial institutions and related entities, for which such an international identifier is required to facilitate automated processing of telecommunication messages in banking and related financial transaction environments.

c) Securities account: ISO 20022
- Safekeeping account of ISO 20022 is the securities account which the account servicer holds account for the account owner. Safekeeping account identification is defined as text format.

d) Cash account: International Bank Account Number (IBAN, ISO 13616)
- ISO 13616 specifies the elements of IBAN used to facilitate the processing of data internationally in data interchange, in financial environments as well as within and between other industries.

e) Character code: Unicode Transform Format (UTF, ISO/IEC 10646)
- ISO/IEC 10646 specifies the Universal multiple-octet coded Character Set (UCS), which is applicable to the representation, transmission, interchange, processing, storage, input and presentation of the written form of the languages of the world as well as additional symbols. Sometimes the character set is expressed as UTF, which is practically equivalent with the UCS.

6.1 Securities numbering

6.1.1 Is the ISIN used for all securities numbering of bond transactions?

6.1.2 What kind of coding schemes other than ISIN are used?

6.1.3 If local securities numbering is mainly used, is it possible to make conversion between local numbering and ISIN? If possible, how are they converted? Are there any manual operations remaining? What is the cost implication of the manual operations?

6.2 Financial institution identification

6.2.1 What kinds of coding schemes are used for financial institution identification codes? If more than one coding schemes are accepted, how are those codes handled?

6.2.2 How do you convert between ISO 9362 (BIC) and local codes, if necessary?

6.2.3 Are there any manual operations remaining? What is the cost implication of the manual operations?

6.3 Securities account

6.3.1 Is the ISO 20022 used?

6.3.2 If not, what kind of coding schemes are used?

6.3.3 If yes, please specify “Account identification”.

6.3.4 Are there any manual operations remaining? What is the cost implication of the manual operations?

6.4 Cash account

6.4.1 Is the IBAN code used?

6.4.2 If not, what kind of code schemes are used?

6.4.3 If yes, please specify Basic Bank Account Number (BBAN).
6.4.4 Are there any manual operations remaining? What is the cost implication of the manual operations?

6.5 Character code and language
6.5.1 Is the Unicode (UTF) used as a character set?
6.5.2 If you use a character set other than Unicode, which standard character set do you use?
6.5.3 Is it desirable to use English as a common language? Otherwise, is it desirable to have standard conversion scheme between local and ISO standards? Are there any manual operations remaining? What is the cost implication of the manual operations?

7 ISO and the local practices in each country
7.1 If there are any local practices in each country, which are to be proposed to a part of ISO standard, please describe them with possible reasons.
7.2 Please comment on how to make the differences between local and global standards narrower.

8 Transaction cost
Analysis about transaction fee for typical business processes (FOP and DVP)
8.1 Fee per transaction
- Who charges to whom for typical business processes?

8.2 Fee for other cases including charging information and policy
8.3 Detailed analysis of cost for the typical cross-border transactions is desirable.

9 Medium- to long-term strategy
Sharing strategy for STP of bond transactions is desirable.
9.1 Are there any official initiatives to promote STP of bond trading in each country?
9.2 From which area STP is promoted?
9.3 What are the biggest challenges for members when it comes STP?
9.4 Please describe ISO 20022-related initiatives on cross-border securities settlement, if any.

10 Any other information and/or comments to be shared by ABMF members
What are challenges and problems encountered?

If there are any questions and comments on this questionnaire, could you send e-mail or call ADB Consultant, please?

Taiji Inui: ADB Consultant for ABMF SF2 (NTT DATA Corporation)
E-mail: inuit@nttdata.co.jp

Thank you very much for your kind cooperation.

Acknowledgement

When drafting this questionnaire, the Chair and Vice-chairs of the ABMF SF2 have given much useful advice to the ADB consultant. National member, expert, and international expert, as well as ADB secretariat and fellow consultants, have made helpful comments and advice to the ADB consultant. The ADB consultant very much appreciates their kind support and assistance.

Appendix 2

Table of Survey Questionnaire Responses

Table A1.1 Bond Market Infrastructures in ASEAN+3

Country	1.3 Bond Market			1.4 Matching		
	1.3.1 Name of Bond Market	1.3.2 Owner and Operator of the Bond Market	1.3.3 Name of Network and Protocol	1.4.1 Name of Matching System	1.4.2 Owner and Operator of Matching System	1.4.3 Name of Network and Protocol
Brunei Darussalam	–	–	–	–	–	–
Cambodia	–	–	–	–	–	–
People's Republic of China	Inter-bank Market (OTC market)	No single owner of the market. Operated by CFETS	Proprietary network TCP/IP	Central Bond Integrated Services System	CCDC	Proprietary network TCP/IP
	Exchange Market	SSE, SZSE	–	NGTS, IEPFS, INTS	Exchange Market–CSDCC	–
Hong Kong, PRC	Unlisted bonds: OTC market	No single owner	No single name of network	CCASS (HKEx), CMUP (CMU)	HKEx (CCASS) Hong Kong Monetary Authority (CMUP)	Message protocol comparable with ISO 015022 (CCASS) SWIFT (CMU)
	Hong Kong Stock Exchange	HKEx	Message protocol comparable with ISO 015022			
Indonesia	OTC market	–	Not connected	BI-SSSS	BI	Proprietary network SNA
	Indonesia Stock Exchange (IDX)	–	Not connected	C-BEST	KSEI	–
Japan	Tokyo (OTC) market	No single name nor operator	No single name of network	PSMS	JASDEC	Proprietary network
	TSE market	TSE	No single name of network	TSE derivatives trading system	TSE	Name: TSE arrownet Protocol: FIX and TSE protocol
Republic of Korea	KRX market	KRX	No name of the network	No name of the system	KRX	Proprietary network for KRX, TCP/IP
	OTC market	No owner or operator	No name of the network	Bond Institutional Settlement System	KSD	Proprietary network for KSD, TCP/IP
Lao PDR	–	–	–	–	–	–
Malaysia	OTC securities market	–	–	–	–	–
Myanmar	–	–	–	–	–	–
Philippines	PDEx FI Spot Market, Repo Program, Lending Program	Philippine Dealing and Exchange Corp., part of the PDS Group SGX Ltd., Computershare Philippines and Tata Consultancy Services, India	Proprietary network	PDEx FI Trading System for spot, repo and securities lending	Philippine Dealing and Exchange Corp.	Proprietary network Frame Relay/Leased Line, Internet via Firepass, dial-up
Singapore	–	–	–	–	–	–
Thailand	BEX	The Stock Exchange of Thailand	SETNET	BEX	The Stock Exchange of Thailand	SETNET
Viet Nam	HNX	Owner: Ministry of Finance Operator: HNX, HOSE, VSD	Proprietary	No specific name	HNX and HOSE	Proprietary TCP/IP
	HOSE					

– = no information.
Source: ABMF SF2.

Table A1.1 Bond Market Infrastructures in ASEAN+3 *(continued)*

1.5 Clearing System			1.6 Cash Settlement System				
1.5.1 Name of clearing system	1.5.2 Owner and Operator of Clearing System	1.5.3 Name of Network and Protocol	1.6.1 Name of Cash Settlement System	1.6.2 Owner and Operator of Cash Settlement System	1.6.3 Name of Network and Protocol	1.6.4 DVP and BIS Model	1.6.5 Intraday Overdraft and Liquidity Saving Features
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
SHCH has launched CCP service from Dec. 19, 2011. Currently, it is used for bonds deposited by SHCH.			HVPS (CNAPS)	PBoC	Proprietary network TCP/IP	Model 1	Yes
No single name	CSDCC	–	No single name	CSDCC	PROP, IST	Model2	Yes
N/A	N/A	N/A	Clearing House Automated Transfer System	Owners: HKMA, HSBC; Standard Chartered Bank (Hong Kong) Limited Bank of China (Hong Kong) Limited. Operator: HKICL	SWIFTNet InterAct and InterBrowse	Model 1 and Model 3	Yes
–	–	–	BI-RTGS	BI	Proprietary network SNA	Model 1	Yes
E-BOCS	KPEI				–	Model 2	
JGBCC system	JGBCC	No specific name	BOJ-NET FTS	BOJ	Proprietary network TCP/IP	Model 1	Yes
JSCC system	JSCC	No specific name					
No name of the system	KRX	Proprietary network for KRX, TCP/IP	BOK-Wire+	BOK	Proprietary network for BOK, TCP/IP	Model 3	N/A BOK provides intraday overdraft through self-collateral repo from November 2011.
Bond Institutional Settlement System	KSD	Proprietary network for KSD, TCP/IP				Model 1	
–	–	–	–	–	–	–	–
Securities/ Equities Clearing	Bursa Malaysia Securities Clearing	–	RENTAS	MyClear	–	–	–
–	–	–	–	–	–	–	–
Expanded Delivery vs. Payment System (eDVP)	Philippine Dealing and Exchange Corp.	Proprietary network Browser-based internet access	Philippine Payments and Settlement System	BSP	SWIFT, proprietary dial-up, computer-to-computer interface with clearing systems	Model 1	Yes
RoSS-PhilPaSS DVP System	Bureau of the Treasury	Proprietary network Point-to-point leased line					
–	–	–	–	–	–	–	–
PTI	The Stock Exchange of Thailand	SETNET	BAHTNET	Bank of Thailand	N/A	Model 1	Yes
SATS	VSD	Proprietary	No specific name	BIDV	N/A	Model 1, and Model 3	None

– = no information.
Source: ABMF SF2.

Table A1.2 Central Securities Depositories in ASEAN+3

Country	2.1 Name of CSD	2.2 Owner and Operator	2.3 Type of Bonds and Dematerialization	2.4 Number of Stakeholders	2.5 List of Transactions
Brunei Darussalam	–	–	–	–	–
Cambodia	–	–	–	–	–
People's Republic of China	CCDC	Owned by the state, operated by CCDC	Government bond, Central bank bills, bank bond, enterprise bond, asset-backed security and Panda bond Paperless and kept in custody in book-entry system.	10,235 institutional participants	FOP, DVP, PAD, DAP
	SHCH	Owned by CFETS, CCDC, CBPMC, and China Gold Coin Co., operated by SHCH	Commercial paper (CP), Super & short-term commercial paper (SCP),Private placement note (PPN), Credit risk mitigation warrant (CRMW),etc.	More than 2,000 participants	FOP, DVP, PAD, DAP
	CSDCC	Operated by its own management and staff	Stocks, Treasury bonds, local government bonds, enterprise bonds, corporate bonds, convertible bonds, repo, exchange-traded fund, warrants, and asset-backed securities.	–	–
Hong Kong, PRC	CMU	The HKMA	Exchange fund notes and bills, government bonds, securities issued by public corporations and supranational Book-entry form (dematerialized) for exchange fund paper and global note form for corporate bonds	156 CMU members	Real time and end-of-day DVP and FOP for all CMU securities
Indonesia	KSEI	Owners: IDX, KPEI, custodian banks, brokerage firms and registrars. Operator: KSEI	Stocks, warrants, exchange-traded fund, participation unit of limited participation mutual fund, corporate bonds, government bonds, Sharia bonds (Sukuks), Certificate of Bank Indonesia (SBI), medium-term notes, promissory notes, and asset-backed securities	Refer to 2.2	For government bonds, BI requires all trades to be settled on against payment basis
	Bank Indonesia Scripless Securities Settlement System (BI-SSSS)	BI	Government bonds (conventional and Sharia), government debt securities (conventional and Sharia), and Central Bank Certificates (SBI, conventional and Sharia)	BI, MoF (Debt Management Office), Banks, Sub-registries (including KSEI), Brokerage Firms	DVP, FOP, issuance, purchase and sale, interest payment, redemption, repo
Japan	BOJ (BOJ-NET)	BOJ	Japanese Government bonds (JGB) Most government bonds are dematerialized	313 including domestic banks, foreign banks, securities companies, insurance companies, and others	DVP, FOP, issuance, interest payment, and redemption
	JASDEC Book-Entry Transfer System for Corporate Bonds, etc.	JASDEC	All types of bonds except JGB paperless book-entry	3384 including issues, JASDEC participants, indirect asset management institutions, and agents	–
Republic of Korea	KSD	KSD	All the bonds are deposited in a registered form. CD and CP are issued with physical certificates.	257 institutions as of the end of 2010	DVP, FOP
Lao PDR	–	–	–	–	–
Malaysia	MyClear RENTAS	MyClear	–	–	–
Myanmar	–	–	–	–	–
Philippines	Philippine Depository and Trust Corp.	Philippine Dealing System Holdings Corp.	Government securities and corporate bonds are 100% dematerialized Short-term corporate bonds–CSD ready to accept in dematerialized form; discussions ongoing with market players	Brokers = 26 Dealers = 33 Institutional investors (direct depository participants) = 3 Custodians = 4 Sponsored investor accounts (opened/maintained by a sponsor broker/dealer) = 1,200	Settlement of trades in the PDEx spot, repo and securities lending transaction (SLT) markets
Singapore	–	–	–	–	–
Thailand	TSD	The Stock Exchange of Thailand	All government bonds and corporate bonds are dematerialized.	Domestic banks, foreign banks and securities companies	TSD acts as the sole depository and settlement agent of bonds.
Viet Nam	VSD	Owner: Government (MOF), Operator: VSD	Government bonds, FCY-dominated bond and corporate bonds All bonds are registered at VSD in form of book entry	Only the government	DVP

– = no information.
Source: ABMF SF2.

Table A1.2 Central Securities Depositories in ASEAN+3 *(continued)*

2.6 Network					2.7
2.6.1 Name of the Network	2.6.2 Type of Lines	2.6.3 Protocol	2.6.4 Interface	2.6.5 Message Format	Link with Other CSDS
–	–	–	–	–	–
–	–	–	–	–	–
Proprietary network	ISDN and dial-up combined	TCP/IP, HTTP, and SOAP	MQ	XML and Text message	CSDCC Outbound links with HK CMU and Clearstream
Proprietary network	ISDN and dial-up combined	TCP/IP, HTTP	MQ	XML and Text message	
No single name	Local participants rent fiber optics and satellite station while overseas customers use dial-up	TCP/IP	–	DBF and TXT	–
SWIFTNet	Leased line and Internet	TCP / IP	SWIFTNet InterAct and InterBrowse	ISO15022	Bilateral: Euroclear, Clearstream, Austraclear New Zealand, Korea Securities Depository (KSD) Unilateral: CMU has an account at Austraclear in Australia China CDC has an account at CMU
–	Fiber optics, leased line, ISDN, and dial-up	TCP/IP	OAQ Oracle database	XML and Text message	KSEI is linked to BI (central bank) for government bonds
Proprietary network	Leased line and dial-up	SNA	Proprietary (FTP) and socket	Proprietary	None
BOJ-NET	IP-VPN	TCP/IP	CORBA	Proprietary. ISO15022 messages formats are also adopted for some transactions under the current BOJ-NET.	None
JASDEC network	ISDN and leased lines	TCP/IP	–	ISO 15022 and CSV	None
SAFE+	Leased line: FEP (front end processor-Internet: SAFE+	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
Proprietary	Internet and point-to-point leased line	HTTPS	Browser-based, e.g., Internet Explorer	Proprietary	No computer-to-computer linkage with other CSDs or ICSDs, but PDTC operates an account with Clearstream and has opened an account with SGX-CDP
–	–	–	–	–	–
SETNET	Leased line	TCP/IP, HTTPS	PTI Terminal	N/A	None
Proprietary network	Leased line, IP-VPN, MPLS	TCP/IP	Terminal	XML	No

– = no information.
Source: ABMF SF2.

Table A1.3 Standards Including Numbering and Coding in ASEAN+3

Country	6.1 Securities Numbering			6.2 Financial Institution Identification			6.3 Securities Account	
	6.1.1 Use of ISIN for All Bond Transactions	6.1.2 Other Coding Schemes	6.1.3 Conversion between Local Numbering and ISIN	6.2.1 Coding Scheme Used	6.2.2 Conversion between BIC and Local Codes	6.2.3 Manual Operations	6.3.1 Use of ISO 20022	6.3.2 Other Coding Schemes
Brunei Darussalam	–	–	–	–	–	–	–	–
Cambodia	–	–	–	–	–	–	–	–
People's Republic of China	ISIN is not used for bond trades or settlement.	Proprietary securities numbering	Conversion table is planned to be created in the system	Proprietary participant code	By creating the conversion table in the system	N/A	Not used	Proprietary account code
Hong Kong, PRC	Yes	-CMU Issue Number -Common Code	ISIN, Common Code and CMU Issue Number are kept in the system database when available	CMU Member Account Number is assigned by internal coding scheme in CMU CCASS Participant Number is assigned by HKEX	CMU: No need to convert because system database can include both BIC and local codes	No	No	Proprietary coding scheme
Indonesia	Yes	Local code	Yes	Both BIC and current proprietary codes	No	No	No.	No
Japan	No	Proprietary securities numbering	No	Proprietary participant code	No	–	No.	Current proprietary account structure.
Republic of Korea	Yes	Local code scheme	Local short code is composed of basic code 9 digit of ISIN	KSD uses account number as an identification number	If necessary, mapping BIC onto local code is executed	N/A	N/A	Please see Part 2
Lao PDR	–	–	–	–	–	–	–	–
Malaysia	–	–	–	–	–	–	–	–
Myanmar	–	–	–	–	–	–	–	–
Philippines	ISINs and local proprietary	For corporate bonds, a 12-character code	It is possible to convert between local numbering and ISIN	PDS-assigned firm codes	Using mapping tables	–	Yes	N/A
Singapore	–	–	–	–	–	–	–	–
Thailand	Yes	N/A	N/A	BIC code	N/A	–	No	Use an account number to transfer the bonds
Viet Nam	Yes	Local code	Automatically converted by VSD's proprietary system	N/A	N/A	N/A	No	Local securities account

– = no information.
Source: ABMF SF2.

Table A1.3 Standards Including Numbering and Coding in ASEAN+3 *(continued)*

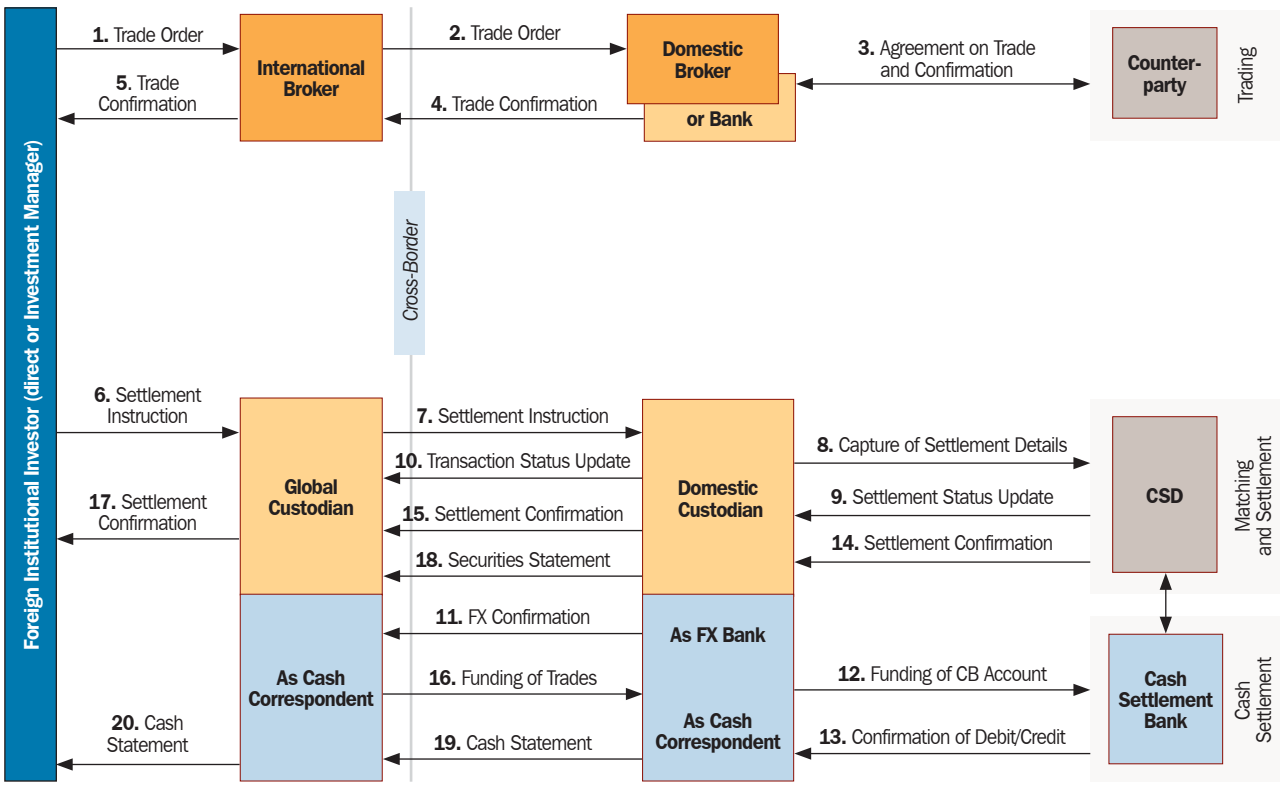
6.3 Securities Account		6.4 Cash Account				6.5 Character Code and Language		
6.3.3 Account Identification	6.3.4 Manual Operations	6.4.1 Use of IBAN code	6.4.2 Other Coding Schemes	6.4.3 BBAN	6.4.4 Manual Operations	6.5.1 Use of Unicode	6.5.2 Other Coding Schemes	6.5.3 Opinion for Standard Language
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
Not used	N/A	Not used	Proprietary account code	Not used	N/A	UTF 8	-	Need to make a standard conversion rule
N/A	No	No	CMU member code	N/A	Not under normal operations	Character set supported by SWIFT	N/A	Yes
No	No	No	Local cash account	Not used	No	No	No	No
Proprietary account identification is used.	–	No	Proprietary account identification.	No	–	No	No	JIS (Japanese Industrial Standard)
Please see Part 2	N/A	No for local transaction	Proprietary account number	If necessary, mapping IBAN onto proprietary code is executed	N/A	No	KSC 5601 for Korean ASCII for English	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
Business Partner ID (BPID)	Transfers of securities into (or out of) the depository	No	The BIC code of the bank, the regular bank account number	N/A	No manual intervention for trades of banks	Yes	N/A	Yes
–	–	–	–	–	–	–	–	–
–	No	No	The Bank of Thailand account number as the reference to transfer the fund	No	–	English/UTF-8	–	–
Yes	No	N/A	N/A	N/A	N/A	UTF-8	No	Further clarification

– = no information.
Source: ABMF SF2.

Appendix 3.1

Description of Model Cross-Border Bond Flow

Figure A1.1 Model Cross-Border Bond Flow



Note: this slide shows just an image and is not based on any realistic facts.
Source: ABMF SF2.

Trade Date

1. Foreign Institutional Investor places order with International Broker
2. International Broker places order with Domestic Broker or Bank
3. Domestic Broker/Bank trades OTC with Counterparty (via phone, Bloomberg, etc.)
4. Domestic Broker/Bank sends trade confirmation to International Broker
5. Foreign Institutional Investor receives trade confirmation
6. Foreign Institutional Investor instructs Global Custodian on securities settlement details and funding details

T+1

7. Global Custodian instructs Domestic Custodian on securities settlement and FX/ funding details (in a single instruction or message)
8. Domestic Custodian transmits settlement details to CSD (capture, upload, or messaging)

9. Domestic Custodian obtains settlement status updates (single arrow shown: active 'sending' of confirmation from CSD)
10. Domestic Custodian communicates settlement status updates to Global Custodian

Settlement Date

11. Domestic Custodian sends FX confirmation to Global Custodian, on required FCY amount
12. Domestic Custodian funds account with central bank or cash clearer
13. Upon transfer of cash, debit/credit confirmation available from central bank/cash clearer (single arrow shown: active 'sending' of confirmation from central bank/cash clearer)
14. Upon transfer of securities, settlement confirmation available from CSD (single arrow shown: active 'sending' of confirmation from CSD)
15. Domestic Custodian sends settlement confirmation for securities and cash to Global Custodian
16. Global Custodian funds Domestic Custodian's nostro account, at FCY correspondent bank, in FCY (before end of day)
17. Global Custodian sends settlement confirmation to Foreign Institutional Investor
18. Domestic Custodian sends securities statement to Global Custodian
19. Domestic Custodian sends cash statement to Global Custodian
20. Global Custodian sends cash statement to Foreign Institutional Investor

Note: T+1 and Settlement Date could be the same date.

Appendix 3.2

Roles and Needs of Stakeholders of Cross-Border Bond Trade and Settlement

The roles of a foreign institutional investor (FII) or investment manager (IM) include the following.

1) **Investment decision making and order placement.** An FII or IM makes an investment decision and places an order with an International Broker, Domestic Broker, or Bank to act on an investment decision (whether or not the FII or IM places the order through a central dealing function or is directly of no consequence for this flow).
2) **Receive trade confirmation.** An FII or IM books on a trade-date basis, and the trade confirmation literally determines all displays, processes, reports, and accounting.
3) **Send settlement instruction.** As a required step to kick off the settlement process, an FII or IM sends the settlement instruction to a Global Custodian (GC), or Domestic Custodian (DC) in case of a direct relationship.
4) **Receive settlement confirmation.** An FII or IM receives settlement confirmation with accounting for the trade done upon trade, and provides critical status update on whether cash or securities are effectively available. FIIs or IMs tend to calculate their positions based on trade entries and settlement confirmations, and periodically reconcile positions with intermediaries' statements (hence, often does not expect to receive daily securities statement).
5) **Receive daily cash statement.** An FII or IM receives daily cash statement regardless of trade volume to check and adjust funding position.

The roles of a GC include the following:

1) **Receive settlement instruction from FII or IM.** A GC receives settlement instruction from an FII or IM which is required to kick off settlement process and its own processes, including debit or credit of client account(s).
2) **Send settlement instruction to Domestic Custodian.** A GC sends settlement instruction to a DC at the place of settlement (PSET, according to industry or SWIFT), which requires that the DC be notified of securities and cash instructions, and kick off the domestic settlement process.
3) **Receive transaction status update notification.** A GC receives a transaction status update notification or message to determine funding requirements by settlement date across PSET and currencies (depending on settlement cycle and specific client requests, which could be a re-iterative process) to kick off funding in LCY or FCY where required.
4) **Receive FX confirmation from Domestic Custodian.** A GC receives an FX confirmation from a DC for effective FCY amount required, in case FX for transaction is requested by GC, based on transaction status information for trade or across trades.
5) **Receive settlement confirmation**. Custodians book on a settlement-date basis, hence, the critical importance of this receipt to trigger onward confirmation to FII or IM, and to kick off FCY payments as well as for accounting entries.
6) **Send settlement confirmation to FII or IM.** A GC sends a settlement confirmation to the FII or IM based on confirmation from DC.
7) **Send funding instruction and message, and arrange funding.** A GC sends funding instruction and message as well as arranges funding into the DC's nostro (for FCY) or direct account (for LCY) to fund daily securities transactions. Messaging and payments process are often integrated.

8) **Receive securities statement(s) from DC.** To be able to reconcile all securities movements with end-of-day positions, a GC receives securities statement(s) from the DC, which is critical due to very high volume across typically 100+ markets' coverage.
9) **Receive cash statement(s) from DC.** To be able to reconcile all cash movements with end-of-day cash positions, a GC receives cash statement(s) from the DC. This is critical due to very high volume of cash entries across 10-20 currencies, and extremely high volume across main funding currencies.
10) **Send daily cash statement(s) to FII or IM.** A GC sends daily cash statement(s) to an FII or IM regardless of trade volume to advise the cash position resulting from the day's booking activities, across currencies.

The roles of a DC include:

1) **Receive settlement instruction from GC.** A DC receives settlement instruction from a GC, which is required to kick off the domestic settlement process and its own processes. This is also done to make sense of a broker confirmation or market notification potentially received prior to settlement instruction (where applicable). A foreign exchange instruction, if required, is typically included in this.
2) **Obtain confirmation of correctness of details of transaction.** A DC obtains confirmation of the correctness of the details of the transaction to be settled**,** which is typically a part of the next two steps.
3) **Capture, message or upload settlement transaction details.** A DC captures, messages, or uploads settlement transaction details into a central securities depository (CSD) to service domestic settlement process.
4) **Receive transaction status update from settlement counterparty or CSD.** A DC receives information on transaction status update from a settlement counterparty or CSD either by communicating with a counterparty, through eyeballing/manual retrieval, or notification/message from the CSD or the pre-matching system to trigger a status update message to the GC, and to calculate effective funding amount to central bank (CB) or cash clearer.
5) **Send transaction status update notification or message to GC.** A DC sends a transaction status update notification or message to a GC based on the status update from the market.
6) **Send FX confirmation to GC.** For the FCY amount required a DC sends an FX confirmation to a GC and if the FX for transaction is requested by the GC. The confirmation is based on transaction status information for trade or across trades.
7) **Receive funding notification from GC.** A DC receives funding notification from a GC to determine where funding will come from, in LCY or FCY, and to potentially drive client cash account entries.
8) **Fund cash or clearing account with CB or cash clearer**. A DC funds the cash or clearing account with the CB or cash clearer based on funding instructions or message from the GC based on client cash account entries.
9) **Receive securities settlement confirmation.** A DC receives a securities settlement confirmation either by eyeballing or manual retrieval, or notification or message, from the CSD to transfer securities in its books in accordance with market settlement, and to trigger settlement confirmation to the GC.
10) **Receive cash settlement confirmation.** A DC receives a cash settlement confirmation either by eyeballing or manual retrieval, or notification or message, from the CB or cash clearer to have an evidence of finality of trade, and to be able to send cash statement to the GC.

11) **Send a combined settlement confirmation to GC.** A DC sends a combined settlement confirmation based on confirmations from the CSD, CB or cash clearer.
12) **Send securities statement(s) to GC.** A DC sends securities statement(s) to the GC for the GC, and effectively the DC, to be able to identify if securities movements may have been booked through the incorrect account. This step is critical where multiple client sub-accounts are involved.
13) **Send cash statement(s) to GC.** A DC sends securities statement(s) to the GC for the GC, and effectively the DC, to be able to identify if cash entries may have been booked through the incorrect account. This step is critical where multiple accounts, funding, and settlement currencies are involved.

The roles of the Central Securities Depository (CSD) include:

1) **Receive settlement details for specific securities transaction.** The CSD receives settlement details for (each) specific securities transaction from both settlement counterparties in the form of manual capture (whether at proprietary terminal, web based, or through a participant's screen), messaging, or data uploading. However, the form of receipt of information is not critical to CSD since the next, and crucial, steps are internal; in addition, strict cut-off times often exist for receipt of data.
2) **Make information on status of transaction.** The CSD makes information on the status of transaction available for the benefit of the settlement counterparties.
3) **Send request for funding to CB or cash clearer.** The CSD sends a request for funding to the CB or cash clearer following conditions conducive for settlement, i.e., matched transaction.
4) **Receive confirmation of cash transfer or settlement from CB or cash clearer.** The CSD receives confirmation of cash transfer or settlement from the CB or the cash clearer to effect transfer of securities between settlement counterparties.
5) **Make available confirmation of settlement-to-settlement counterparties.** As conclusion of settlement, the CSD makes available the confirmation of settlement-to-settlement counterparties.

The roles of the CB or Cash Clearer include:

1) **Receive request for funding from CSD.** The CB or cash clearer receives the request for funding from the CSD as a trigger for its own cash settlement process.
2) **Make available information on status of transaction or funding request.** The CB or cash clearer makes available information on status of transaction or funding request for the benefit of the settlement counterparties (for pending transaction, insufficient funds, etc.).
3) **Make available confirmation of cash transfer or settlement to CSD and to settlement counterparties.** As conclusion of the cash part of settlement, and to provide CSD with trigger for transfer of securities, and participants with part-trigger for settlement confirmation, the CB or cash clearer makes available the confirmation of cash transfer or settlement to the CSD and to the settlement counterparties.

Appendix 4

Information Sessions of ASEAN+3 Bond Market Sub-Forum 2

1st ABMF SF2 on 28 September 2010 in Tokyo, Japan
- No information session

2nd ABMF SF2 on 14 December 2010 in Manila, Philippines
- *Will Transaction Costs be High in Asia?: A Global Custodian's View.* Presentation by Mr. Mike Tagai, J.P. Morgan
- *How to Make Efficient and Effective Discussion to Set Standards: Lessons from the EU and SMPG, and Tips for a Successful International Discussion.* Presentation by Mr. Alex Kech, SWIFT Standards
- *How to Make International IT Developments Successful.* Presentation by Sun Gard

3rd ABMF SF2 on 17 February 2011 in Kuala Lumpur, Malaysia
- *Regional Custodian Business Chain and Major IT Obstacles for HSBC* by Mr. Patrick Cichy, HSBC Securities Service.
- *Pre-Settlement Matching System (PSMS)* etc. by Mr. Shunichiro Unno and Mr. Yuji Sato, JASDEC

4th ABMF SF2 on 1 July 2011 in Jeju Island, Republic of Korea
- *How Omgeo can Contribute Standardization and Harmonization,* by Mr. Hong Keun Park and Mr. Yuji Tanaka, Omgeo

5th ABMF SF2 on 13 September 2011 in Bali, Indonesia
- *Better IT Infrastructure to Improve Bond Market Information Collection.* Presentation by KOSCOM
- *Europe's Efforts after Giovannini Report.* Presentation by Mr. Sebastien Cochard, BNP Paribas
- *ECB's Target 2 Securities and Implication for Asia.* presentation by Mr. Taketoshi Mori, Bank of Tokyo-Mitsubishi UFJ

Appendix 5

Respondent-Institutions During SF2 Country Visits

PRC	Bank of China
PRC	China Central Depository and Clearing Co. Ltd.
PRC	China Construction Bank
PRC	China Foreign Exchange Trade System
PRC	China Securities Depository and Clearing Corporation Limited Shanghai
PRC	China Security Regulatory Commission
PRC	HSBC Shanghai
PRC	Industrial and Commercial Bank of China Limited
PRC	National Association of Financial Market Institutional Investors
PRC	People's Bank of China
PRC	Shanghai Clearing House
PRC	Shanghai Stock Exchange
PRC	Zhong Lun Law Firm
HKG	Hong Kong Monetary Authority
HKG	HSBC
HKG	J.P. Morgan
HKG	Slaughter and May, Hong Kong Office
HKG	State Street
INO	Bank Indonesia
INO	BAPEPAM-LK, Indonesia Capital Market and Financial Institution Supervisory Agency
INO	Deutsche Bank AG
INO	HSBC
INO	Indonesia Central Securities Depository
INO	Indonesia Clearing and Guarantee Corporation
INO	Indonesia Stock Exchange
MAL	Bank Negara Malaysia
MAL	CIMB
MAL	Citi Corp
MAL	Deutsche Bank AG
MAL	HSBC
MAL	Standard Chartered
PHI	Bangko Sentral ng Pilipinas
PHI	Deutsche Bank AG
PHI	HSBC

PHI	ING Commercial Banking
PHI	Philippines Depository and Trust Corporation
PHI	Sycip Salazar Hernandez and Gatmaitan
THA	Securities and Exchange Commission Thailand
THA	The Stock Exchange of Thailand
THA	Bank of Thailand
THA	Thailand Securities Depository
THA	HSBC
THA	Siam Premier International Law Office Limited
THA	Standard Chartered
THA	Thai BMA
VIE	Allens Arthur Robinson
VIE	Bank for Investment and Development of Vietnam
VIE	Citibank
VIE	Deutsche Bank AG
VIE	Hanoi Stock Exchange
VIE	HSBC
VIE	Standard Chartered
VIE	State Bank of Vietnam
VIE	State Securities Commission
VIE	Viet Nam Bond Market Association
VIE	Vietnam Securities Depository

Abbreviations

ABMI	–	Asian Bond Markets Initiative
ABMF	–	ASEAN+3 Bond Market Forum
ABS	–	Asset-Backed Securities
ADB	–	Asian Development Bank
ADI	–	Authorized Depository Institution
AEC	–	ASEAN Economic Community
AFT	–	Auto-feeding of concluded transactions on electronic trading platform at Bloomberg
AITS	–	Automated Inter-bank Trading System
AMRO	–	ASEAN+3 Macro-economic Research Office
ANNA	–	Association of National Numbering Agencies
ASEAN	–	Association of Southeast Asian Nations
ASEAN+3	–	ASEAN, People's Republic of China, Japan, and Republic of Korea
BAPEPAM-LK	–	Badan Pengawas Pasar Modal Bapepam dan Lembaga Keuangan, Indonesia Capital Market and Financial Institution Supervisory Agency
BAHTNET	–	Bank of Thailand Automated High Value Transfer Network
BBAN	–	Basic Bank Account Number
BBCA	–	PT Bank Central Asia Tbk
BCS	–	Bursa Clearing and Settlement System
BEX	–	Bond Electronic Exchange
BI	–	Bank Indonesia
BIC	–	Business Identifier Code
BIDV	–	Bank for Investment Development of Vietnam
BIS	–	Bank for International Settlements
BISS	–	Bond Institutional Settlement System
BI-SSSS	–	Bank Indonesia-Scripless Securities Settlement System
BM	–	Bursa Malaysia
BMA	–	Thai Bond Market Association
BMD	–	Bursa Malaysia Depository
BMRI	–	PT Bank Mandiri Tbk
BMSC	–	Bursa Malaysia Securities Clearing Sdn Bhd

BRU	–	Brunei Darussalam
BNGA	–	PT Bank CIMB Niaga Tbk
BNLI	–	PT Bank Permata Tbk
BNM	–	Bank Negara Malaysia
BOJ	–	Bank of Japan
BOJ-NET FTS	–	BOJ-NET Funds Transfer System
BOK	–	Bank of Korea
BOK-Wire+	–	New Bank of Korea Financial Wire Network System
BOT	–	Bank of Thailand
BQS	–	OTC Bond Quotation System
BSP	–	Bangko Sentral ng Pilipinas
BSRD	–	Bangko Sentral Registration Document
BTr	–	Bureau of Treasury
B-TRiS	–	Bond-Trade Report and Information Service
BTS	–	Bursa Trade System
C-BEST	–	Central Depository and Book-Entry Settlement
CBGS	–	Central Bond General System
CBPMC	–	China Banknote Printing and Minting Co.
CCDC	–	China Central Depository and Clearing
CCP	–	Central CounterParty
CD	–	Certificate of Deposit
CDP	–	Central Depository (Pte.) Limited
CDS	–	Credit Default Swap
CFETS	–	The China Foreign Exchange Trade System
CHATS	–	Clearing House Automated Transfer System
CLS	–	Continuous Linked Settlement
CMU	–	Central Moneymarkets Unit
CMUP	–	Central Moneymarkets Unit Processor
CNAPS	–	China National Automatic Payment System
CNS	–	Continuous Net Settlement
COINS	–	Corporate Information Superhighway
CORBA	–	Common Object Request Broker Architecture
CP	–	Commercial Paper
CRM	–	Credit Risk Mitigation
CSD	–	Central Securities Depository
CSDCC	–	China Securities Depository and Clearing Corporation
CSRC	–	China Securities Regulatory Commission
CSSO	–	Clearing and Settlement Systems Ordinance (Hong Kong, China)
CSV	–	Comma Separated Value
CTP	–	Centralized Trading Platform
DAP	–	Delivery After Payment
DCSS	–	Debt Securities Clearing and Settlement System
DIFB	–	Deposit Insurance Fund Bonds
DTCC	–	The Depository Trust & Clearing Corporation

DVP	–	Delivery versus Payment
e-BOCS	–	Electronic Bond Clearing System
eDVP	–	Expanded Delivery versus Payment System
ETF	–	Exchange Traded Fund
ETP	–	Electronic Trading Platform
FAST	–	Fully Automated System for Issuing/Tendering
FCY	–	Foreign Currency
FEP	–	Front End Processor
FIE	–	Fixed Income Exchange
FII	–	Foreign Institutional Investor
FIMS	–	Foreign Investment Management System
FITS	–	Fixed Income Trading System
FIX	–	Financial Information eXchange
FOP	–	Free of Payment
FSC	–	Financial Services Commission
FSCMA	–	Financial Investment Services and Capital Markets Act
FSS	–	Financial Supervisory Service
FX	–	Foreign Exchange
GC	–	Global Custodian
GoE	–	Group of Experts
GSBS	–	Government Securities Book-entry System
GSED	–	Government Securities Eligible Dealers
HKG	–	Hong Kong Special Administrative Region
HKAB	–	Hong Kong Association of Banks
HKEx	–	Hong Kong Exchanges and Clearing Limited
HKICL	–	Hong Kong Interbank Clearing Limited
HKMA	–	Hong Kong Monetary Authority
HNX	–	Hanoi Stock Exchange
HOSE	–	Ho Chi Minh Stock Exchange
HSBC	–	Hong Kong and Shanghai Banking Corporation
HTTP	–	Hyper Text Transfer Protocol
HVPS	–	High Value Payment System
IBAN	–	International Bank Account Number
ICSD	–	International Central Securities Depository
IDIB	–	International Development Institute Bond
IDX	–	Indonesia Stock Exchange
IEPFS	–	Integrated Electronic Platform for Fixed-income Securities
IFTS	–	Interbank Funds Transfer System
IM	–	Investment Manager
INO	–	Republic of Indonesia
INTS	–	Integrated Negotiating Trade System
IRC	–	Investment Registration Certificate
ISDN	–	Integrated Services Digital Network
ISIN	–	International Securities Identification Number

ISO	–	International Organization for Standardization
ISS	–	Institutional Settlement Service
IST	–	Integrated Settlement Terminal
JASDEC	–	Japan Securities Depository Center Inc.
JGB	–	Japanese Government Bond
JGBCC	–	Japan Government Bond Clearing Corporation
JPN	–	Japan
JPY	–	Japanese Yen
JSCC	–	Japan Securities Clearing Corporation
JSX	–	Jakarta Stock Exchange
KGB	–	Korean Government Bond
CAM	–	Cambodia
KOFEX	–	Korea Futures Exchange
KOFIA	–	Korea Financial Investment Association
KOSDAQ	–	Korean Securities Dealers Automated Quotations
KOR	–	Republic of Korea
KPEI	–	PT Kliring Penjaminan Efek Indonesia, Indonesia Clearing and Guarantee Corporation
KRX	–	Korea Exchange
KSD	–	Korea Securities Depository
KSEI	–	PT Kustodian Sentral Efek Indonesia, Indonesia Central Securities Depository
KTB	–	Korea Treasury Bond
KTS	–	KRX Electronic Trading System for Government Bonds
LAO	–	Lao People's Democratic Republic
LCY	–	Local Currency
LEI	–	Legal Entity Identifier
MAS	–	Monetary Authority of Singapore
MBS	–	Mortgage-Backed Securities
MCB	–	Minimum Cash Balance
MEPS+	–	MAS Electronic Payment System plus
MLA	–	Minimum Liquid Assets
MYA	–	Myanmar
MNS	–	Multilateral Netting System
MNS System	–	Multilateral Net Settlement System
MOF	–	Ministry of Finance
MOU	–	Memorandum of Understanding
MQ	–	Message Queue
MSB	–	Monetary Stabilization Bonds
MTN	–	Medium-Term Note
MAL	–	Malaysia
NAFMII	–	National Association of Financial Market Institutional Investors
NGTS	–	New Generation Trading System
NIFC	–	National Inter-bank Funding Center
NNAs	–	National Numbering Agencies

NRBA	–	Non-resident Baht Account
NRBS	–	Non-resident Baht Account for Securities
OTC	–	Over-The-Counter
PAD	–	Payment After Delivery
PBOC	–	People's Bank of China
PD	–	Principal Dealer
PDEx	–	Philippine Dealing and Exchange Corporation
PDTC	–	Philippine Depository and Trust Corporation
PHI	–	The Republic of the Philippines
PhilPaSS	–	Philippine Payments and Settlement System
PI	–	Principal & Interest
PPN	–	Private Placement Notes
PRC	–	People's Republic of China
PROP	–	Participant Remote Operation Platform
PSET	–	Place of Settlement
PSMS	–	Pre-Settlement Matching System
PTI	–	Post Trade Integration
PTS	–	Proprietary Trading System
PVP	–	Payment versus Payment
QFII	–	Qualified Foreign Institutional Investor
QL	–	Qualifying Liabilities
RENTAS	–	Real-time Electronic Transfer of Funds and Securities
RoSS	–	Registry of Scripless Securities
RP	–	Repurchase Agreement (repo)
RPS	–	Retail Payment System
RSI	–	Regional Settlement Intermediaries
RTGS	–	Real Time Gross Settlement
RVP	–	Receive versus Payment
S	–	Settlement day
S-1	–	Settlement day - 1
SC	–	Securities Commission of Malaysia
SCCS	–	Securities Clearing and Computer Services Pte. Ltd
SCP	–	Super & Short-term Commercial Paper
SD	–	Settlement Day
SDH	–	Synchronous Digital Hierarchy
SEC	–	Securities and Exchange Commission
SET	–	The Stock Exchange of Thailand
SF1	–	Sub-Forum 1
SF2	–	Sub-Forum 2
SGS	–	Singapore Government Securities
SIN	–	Singapore
SGX	–	Singapore Exchange
SHCH	–	Shanghai Clearing House
SI	–	Settlement Institution

SIMEX	–	Singapore International Monetary Exchange
SNA	–	Systems Network Architecture
SOAP	–	Simple Object Access Protocol
SPEEDS	–	Sistem Pemindahan Elektronik Dana dan Sekuriti
SRC	–	Securities Regulation Code
SRO	–	Self-Regulatory Organization
SSC	–	State Securities Commission
SSDS	–	Scripless Securities Depository System
SSE	–	Shanghai Stock Exchange
SSS	–	Securities Settlement System
SSX	–	Surabaya Stock Exchange
STFB	–	Short Term Financial Bond
STP	–	Straight Through Processing
SWIFT	–	Society for Worldwide Interbank Financial Telecommunication
SZSE	–	Shenzhen Stock Exchange
TCH	–	Thailand Clearing House
TCP/IP	–	Transmission Control Protocol/Internet Protocol
T	–	Trade date
T+1	–	Trade date + 1
T+2	–	Trade date + 2
T+3	–	Trade date + 3
T+4	–	Trade date + 4
TF3	–	Task Force 3
TFEX	–	Thailand Futures Exchange
TFIIC	–	Thailand Financial Instruments Information Center
THA	–	The Kingdom of Thailand
THB	–	Thai Baht
TSD	–	Thailand Securities Depository
TSE	–	Tokyo Stock Exchange
UCS	–	Universal multiple-octet coded Character Set
UTF	–	Unicode Transform Format
VIE	–	Socialist Republic of Viet Nam
VPN	–	Virtual Private Network
VSD	–	Vietnam Securities Depository
XML	–	Extensible Markup Language

Part 2
Bond Markets and Their Infrastructures in Each Economy

Contents

Figures and Table

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People's Republic of China (PRC)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

People's Republic of China's bond market is comprised of the Inter-bank Bond Market and the exchange bond market. More than 99% of trades (by value) take place in the Inter-bank Bond Market.[1] This market is also called the "China over-the-counter (OTC) market." The China Foreign Exchange Trade System (CFETS), also known as the National Interbank Funding Center (NIFC), provides the electronic platform for the Inter-bank Bond Market.

Inter-bank Bond Market-traded bonds are settled through the China Central Depository and Clearing (CCDC) or the Shanghai Clearing House (SHCH), while exchange-traded bonds are settled through the China Securities Depository and Clearing Corporation (CSDCC). Currently, government bonds, policy bank bonds, central bank bills, and other instruments are settled by CCDC, while super and short-term commercial papers (SCP), commercial papers (CP), private placement notes (PPN), etc. are settled by SHCH. Cash are transferred through the high-value payment system (HVPS) of the China National Automatic Payment System (CNAPS), a type of real-time gross settlement (RTGS), which is operated by the People's Bank of China (PBOC). Shanghai Clearing House (SHCH) is designated to provide centralized clearing service in the Inter-bank Bond Market and slated for production operation near the end of year 2011. The PBOC is opening the Inter-bank Bond Market for cross-border trade.

Nonresidents need to access to the exchange markets—the Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE)—as a qualified foreign institutional investor (QFII). Data traded on the exchange markets are transmitted to the CSDCC and settled using commercial bank money (Part 3, Figure A.1).

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[1] There is a retail bond (OTC) market called the commercial bank counter market. Since the size of the market is negligibly small compared with the interbank bond market, it is not included in this survey.

1.2. Description of Related Organizations

China Foreign Exchange Trade System and National Interbank Funding Center (CFETS/NIFC)

CFETS, founded on 18 April 1994, is a sub-institution of the PBOC. Its main functions include: organizing and providing systems for foreign exchange (FX) trading, renminbi lending, bond trading, and exchange-rate and interest-rate derivatives trading; providing clearing, information, risk management, and surveillance services on interbank markets; and engaging in other businesses authorized by the PBOC. CFETS is also called ChinaMoney.

The Shanghai Stock Exchange (SSE)

SSE was founded on 26 November 1990 and began operations on 19 December 1990. It is a membership institution directly governed by the China Securities Regulatory Commission (CSRC). Membership of the SSE includes domestic brokers and a small number of foreign brokers. SSE deals with A-Shares, B-Shares, government, corporate and convertible bonds, and securities investment funds.

The Shenzhen Stock Exchange (SZSE)

SZSE, established on 1 December 1990, is a self-regulated legal entity under the supervision of CSRC. Its main functions include providing venue and facility for securities trading, formulating operational rules, arranging securities listing, organizing and supervising securities trading, offering membership supervision and oversight of listed companies, managing and publicizing market information and other capacities permitted by CSRC.

China Central Depository and Clearing Company, Limited (CCDC)

CCDC is a state-owned financial institution operating the China Bond Integrated Business System (CCDC system). CCDC mainly serves the Inter-bank Bond Market and also acts as general custodian for cross-market eligible issues. CCDC-eligible securities are dematerialized, including: Treasury bonds, local government bonds, policy bank bonds, agency bonds, commercial bank bonds, other financial bonds, enterprise bonds, commercial papers (CPs), medium-term notes (MTNs), mortgage-backed securities (MBS) and asset-backed securities (ABS), foreign bonds, domestic dollar bonds, among others. There are over 10,000 system members, including almost all financial institutions and various non-financial entities, as well as institutional investors. CCDC also provides nearly 9 million retail bond investors in the OTC market with inquiry service. CCDC business line covers issuance, registration, custody, settlement, principal and interest (PI) payment, and, collateral management, as well as services on information, research, consultancy, training, and magazine production. CCDC establishes a proprietary network based on multi-telecommunications operator lines, with integrated services digital network (ISDN) and dial-up combined. CCDC has several links with central securities depositories (CSDs) and international CSDs (ICSDs), including the link with CSDCC, outbound links with Hong Kong Monetary Authority's Central Moneymarket Unit (CMU), and Clearstream. CCDC is also called ChinaBond.

China Securities Depository and Clearing Corporation (CSDCC)

CSDCC is owned by SSE and SZSE, and operates the CSDCC system for the exchange

market. CSDCC-eligible securities are dematerialized, which include: stocks, bonds,[2] warrants, exchange trade funds (ETFs), ABSs, and repo. CSDCC business line covers central registry and depository, wherein security companies and custodian banks act as sub-custodians. CSDCC is also known as ChinaClear.

Shanghai Clearing House (SHCH)

SHCH was authorized by the PBOC and the Ministry of Finance of China, and incorporated by the CFETS, CCDC, China Banknote Printing and Minting Company Limited (CBPMC), and China Gold Coin Corporation. SHCH aims to provide central counterparty (CCP) net clearing-based and CSD services for the interbank renminbi and FX market. SHCH currently provides CSD service for innovative instruments and money market tools of the inter-bank market, covering super and short-term commercial papers (SCP), commercial papers (CP), Credit Risk Mitigation (CRM) instrument, and private placement notes (PPN), etc. SHCH has established its proprietary business network through the Synchronous Digital Hierarchy (SDH). SHCH was established in November 2009 by a decree from the PBOC and the Ministry of Finance of China. It provides a CCP function to mitigate counterparty risk and settlement risks, following the Group of Twenty (G-20) recommendation. SHCH is currently focused on the interbank bond and both spot and derivatives FX markets.

1.3 Trading

1.3.1 Inter-bank Bond Market

The Inter-bank Bond Market is a wholesale OTC market also known as the China OTC market. The China OTC market started in 1997 and occupies a dominant position, accounting for more than 97% of trading in the entire market share in 2010. The market does not have a single owners, while the market is operated by CFETS. Participants in the Inter-bank Bond Market are institutional investors. It is a quote (price)-driven market trading government bonds, central bank bills, enterprise bonds, policy bonds,[3] other financial bonds, subordinate bonds, short-term financial bill (STFB), US dollar-denominated bonds, international development institution bonds (IDIB), ABS, and MTN. The People's Bank of China (PBOC) supervises and regulates the Inter-bank Bond Market. In recent years, with market-oriented guidelines, the PBOC, together with relevant departments and the industry, implemented a series of measures to promote the development of the Inter-bank Bond Market. To this end, the PBOC also supervises and guides the National Association of Financial Market Institutional Investors (NAFMII).

Bonds are traded through the CFETS/NIFC and brokers or dealers. The Automated Interbank Trading System (AITS) of the CFETS has a trade-matching function. The AITS is linked with the Centralized Bond Book-Entry System of the CCDC and the Clearing Business Integrated Processing System of the SHCH to support a straight-through processing (STP) of the trading and settlement layers of the Inter-bank Bond Market. The market is regulated by the PBOC.

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2 Bonds include Treasury bonds, local government bonds, enterprise bonds, listed corporate bonds, and convertible bonds.

3 Policy bonds are issued by Chinese policy banks such as the State Development Bank, China Import and Export Bank, and China Agriculture Development Bank, and often represent subordinated debts.

1.3.2 Exchange Market

The exchange market is a retail market open to individuals and non-bank financial institutions. The market is owned and operated by the SSE and SZSE. In 1992, the stock exchanges started government bond trades, and by 1995, all government bonds are traded in the stock exchanges. To support STP, the exchanges are linked with the CSDCC. The market is regulated by the CSRC. Although the exchange market provides platforms for bond transactions, institutional investors prefer to transact bonds in the Inter-bank Bond Market.

1.4 Central Counterparty Clearing

1.4.1 Central Counterparty for Bonds Traded in the China Over-the-Counter Market

SHCH started to provide CCP service for bond transactions in the Inter-bank Bond Market since 19 December 2011. Currently, it is used for bonds deposited by the SHCH.

1.4.2 Central Counterparty for Bonds Traded in the Exchange Market

Bonds traded through the exchanges are netted through CCP, before they are settled at the CSDCC.

1.5 Bond Settlement

1.5.1 Bond Settlement in the China Over-the-Counter Market

Most bonds (or normal bonds), including government bonds traded in the China OTC market, are settled at the CCDC. However, new instruments such as super short term CP (SCP) are settled at SHCH. Normal bond transactions are matched by the Central Bond Integrated Services System and settled through the safekeeping account in the centralized bond book-entry system of the CCDC. The centralized bond book-entry system is linked with the AITS of CFETS to support STP of the trading and settlement layers of the Inter-bank Bond Market.

CCDC's network is a proprietary network. The types of lines are a combination of ISDN and dial up. The protocols used are Transmission Control Protocol/Internet Protocol (TCP/IP), Hyper Text Transfer Protocol (HTTP), and Single Object Access Protocol (SOAP). The interface is used Message Queue (MQ), and message formats use Extensible Markup Language (XML) and text.

For bonds deposited by the SHCH, trades are matched by the Clearing Business Integrated Processing System and settled by the Securities Settlement System of the SHCH after receiving transactions from CFETS.

SHCH has established its proprietary business network via a Synchronous Digital Hierarchy (SDH).

1.5.2 Bond Settlement in the Exchange Market

Bonds are traded through the exchanges and settled at the CSDCC after they have been netted also through the CSDCC, which also serves as the CCP.

Local participants use fiber optic lines and satellite network to access CSDCC's system. Overseas customers, on the other hand, use dial-up connections. The protocol is based on TCP/IP, and message formats are dBase's underlying file format (DBF) and text.

1.6 Cash Settlement

1.6.1 Cash Settlement Using Central Bank Money

Settlement of the bond transactions at the CCDC/SCH is simultaneously processed with cash settlement through the current accounts of HVPS of CNAPS in delivery-versus-payment (DVP) Model 1 of the Bank for International Settlements (BIS) definition. In 2004, the CCDC system linked to the HVPS, which achieved DVP for interbank bond trades. Institutions could also achieve DVP through commercial bank agents that have an account in HVPS. However, this route has not been utilized yet. So far, the overall DVP technical mechanism has been in place, with characteristics of RTGS, central bank money, and strongest finality as a true DVP. For bond transactions settled at the SHCH using DVP mode, cash settlement can be processed in three ways. Institutions who have accounts in HVPS could achieve DVP directly through HVPS. Institutions who do not have accounts in HVPS could achieve DVP either through commercial bank agents, or through their cash settlement accounts at the SHCH. The intraday liquidity facility includes intraday overdraft and collateralized lending is available. Collateralized lending will be used prior to the intraday overdraft. Overnight overdraft is not allowed.

A real-time monitoring system for securities is available for the Inter-bank Bond Market. The monitoring system provides a real-time platform to detect operating conditions, speeds up emergency responses, and significantly improves regulation effectiveness.

The Inter-bank Bond Market is based on a proprietary network using leased lines and dial-up lines provided by multi-vendors. The communication protocol is based on TCP/IP.

1.6.2 Cash Settlement using Commercial Bank Money

Cash settlement is done by CSDCC using Participant Remote Operating Platform (PROP) for SSE market's business and Integrated Settlement Terminal (IST) for SZSE market's business. DVP is settled by Model 2 of the BIS definition.

2. Typical Business Flows

2.1 Delivery-Versus-Payment Flowchart for the China Over-the-Counter Market

The DVP flowchart for the China OTC Market is shown in Part 3, Figure A.2.

2.2 Delivery-Versus-Payment Flowchart for the Exchange Market

The DVP flowchart for the exchange market is illustrated in Part 3, Figure A.3.

2.3 Delivery-Versus-Payment Flowchart for Cross-Border Transactions in the Over-the-Counter Bond Market

China is opening its OTC market (Inter-bank Bond Market) for cross border trades. The PBOC published a notice in August 2010 on renminbi investments by three kinds of institutions in the Inter-bank Bond Market in China on a pilot basis. Please refer to Appendix 1.

For the bond transaction flow for foreign investors in the OTC market, please refer to Part 3, Figure A.4.

2.4 DVP Flowchart for Cross-Border Transactions (Exchange Markets)

For bond transaction flows for foreign investors in the exchange market, please refer to Part 3, Figure A.5.

3. Matching

3.1 Inter-bank Bond Market

On the trading aspect, two matching mechanisms are introduced in the Inter-bank Bond Market through an electronic trading platform operated by CFETS—the bilateral negotiation method and the click-and-deal method. The bilateral negotiation method refers to negotiation on the quotation's key fields between the quotation's initiator and the counterparty. The deal is closed when the initiator and counterparty reach an agreement on key fields. Under the click-and-deal method, the initiator can place a click-and-deal quote in the market, which can be entered into two types. The first type is market-making quotation, which is entered by the market maker. The second is the non-market-making quotation, a one way buy-or-sell quotation, which is entered by any member including a market maker. A counterparty can select a quote and enter the amount he wants to trade and thus 'deal'. Besides, the CFETS electronic trading system provides limit-order functionality under the click-and-deal trading mode. A price limit order is a one-way buy-or-sell order that is matched with a click-and-deal quote. Since a price limit order cannot match with another price limit order, this trading mode is classified under the click-and-deal quote method.

CCDC/SHCH implements automated matching through DVP and FOP. If trade takes place in CFETS platform, CCDC/SHCH receives the data automatically. The CCDC/SHCH then asks both parties to confirm the trading order, and processes the settlement after the confirmations are matched. If counterparties trade outside CFETS system, one party needs to input settlement instruction into the CCDC/SHCH system. The CCDC/SHCH system automatically asks the other party to confirm. If not, CCDC/SHCH does not process settlement. After matching the order, CCDC/SHCH settles the trade in FOP or DVP, as requested by customers.

3.2 Exchange Market

Matching in the exchange market is integrated in its trading system. The SSE uses both the New Generation Trading System (NGTS) and the Integrated Electronic Platform for Fixed-income Securities (IEPFS) for bond trade. The SZSE system uses

the auction trade system and the Integrated Negotiating Trade System (INTS) for bond trade. The matching system is owned and operated by the exchange market it serves.

4. Settlement Cycle

The settlement cycle allows for any date agreed between the counterparties, although T+1 and T+0 are most common for OTC market. Net settlement for bond trades occurs on T+1 at 4:00 p.m., but funding needs to be arranged on the previous day and to be sent by 3:00 p.m. on T+1 for exchange market. Trading data is transferred from the stock exchanges to CSDCC on the trade date, and book-entry transfers are effectuated at end of day of the trade date. If funds are not provided to the client's account, bonds will be withheld by CSDCC until the settlement is cleared. The failed party pays a penalty. CSDCC also supports securities lending transactions and its system supports STP from and to participants.

The standard settlement cycle of trade in government bonds to the settlement is T+1. The reasons for the differences between settlement cycles of typical business processes are: (1) market infrastructure and principle, (2) differences in settlement complexity, and (3) differences in participants' risk level. At present, there is no initiative to shorten settlement cycles. Also, such an initiative should be led by market participants.

5. Numbering and Coding

Both the CCDC and CSDCC settle government-bonds numbering and coding. The numbering and coding process for each CSD is further elaborated below.

5.1 Numbering and Coding for the China Central Depository and Clearing Company, Limited (CCDC)

5.1.1 Securities Numbering

All securities registered on the Inter-bank Bond Market are given an International Securities Identification Number (ISIN). The ISIN is not used for bond trades or settlement, but rather proprietary securities numbering is used. The CCDC is planning to create a conversion table within the system to make possible the conversion of proprietary numbering to ISIN.

5.1.2 Financial Institution Identification

A proprietary participant code is used for financial institution identification. By creating the conversion table in the system, the conversion of proprietary code into the business identifier code (BIC, ISO 9362) is possible.

5.1.3 Securities Account

For securities accounts, the proprietary account code is used instead of ISO 20022.

5.1.4 Cash Account

The proprietary account code is also used for cash accounts instead of the International Bank Account Number (IBAN).

5.1.5 Character Code and Language

Unicode (UTF 8) is used for character codes. For the language code, it is not desirable to use English as a common language, thus, the need to make a standard conversion rule.

5.2 Numbering and Coding for the China Securities Depository and Clearing Corporation (CSDCC)

5.2.1 Securities Numbering

For securities numbering, the local code is still used instead of the ISIN. It is possible to convert local numbering to ISIN using a conversion rule.

5.2.2 Financial Institution Identification

Financial institution identification codes use local codes instead of the ISO 9362 (BIC). A software program is used in converting BIC and local codes.

5.2.3 Securities Account

Local securities account code is used for securities account.

5.2.4 Cash Account

For local accounts, local account code is used instead of the IBAN.

5.2.5 Character Code and Language

Unicode (UTF) is not used as the character set.

6. Medium- to Long-Term Strategy

6.1 CFETS Medium- to Long-Term Strategy

As the main trading platform and the price setting center of RMB products, CFETS will continue to strengthen the construction of infrastructure through promoting debt financing instruments innovation, which is to comply with market demand, going a step further to optimize the market transaction mechanism and service mode, and expanding market participants including continuously introducing foreign institutional investors.

6.2 CCDC Medium- to Long-Term Strategy

CCDC has three major targets to achieve by 2014. First, ensure that its core business, management and systems meet international standards and are fully prepared for the opening up of China's bond market to the world, as well as supporting the RMB bond market's move to become the regional core market. Second, diversify on the basis of professionalization: establishing its strengths while developing its core competencies and new business; protecting against risk and increasing our overall operating capacity. Third, improve its internal management in line with modern financial corporate standards in order to reap both economic and social rewards.

CCDC is trying to enhance its comprehensive issuance services, expanding the coverage and depth of registration and depository services, improving its customer service system, improving IT system construction standards, and promoting strategic research and cooperative exchange.

Cross-border bond-related business will be promoted based on the agreements and Memoranda of Understanding (MOUs) with ICSDs and other CSDs. CCDC shall participate in the International Standardization Organization and shall participate in making the standard rules and promoting related business. Also, CCDC shall consider the situation of each country and each region, and shall support local business as much as possible.

6.3 SHCH Medium- to Long-Term Strategy

Continuous improvement of various aspects of registration, custody, clearing and settlement services, and enhancement of STP processing capabilities would be the core of the Mid- to Long-Term Strategy and Technical System Construction Plan of SHCH. As a clearing institution and CSD, the business area of SHCH includes registration, depository, clearing, settlement and other relevant services of RMB and foreign exchange cash and derivatives.

In terms of registration and depository service, SHCH would improve the efficiency of registration and depository service, as well as reduce the operational risk to meet regulatory requirements. In the aspects of registration, custody, settlement, interest payment, information disclosure, evaluation, collateral management and other information services for innovative, fixed-income and moneymarket instruments, SHCH would enhance the quality of services by an automated and standardized procedure according to relative international standard.

In terms of market services, when broadening the business scope of the CCP clearing and enrich the level and range of clearing members, SHCH would implement the recommended standardized approach, such as BIS and other international standardized institutions. Firstly, it would support and coordinate market regulatory requirement, reform OTC market transactions stratification and settlement agent to improve efficiency and enhance incentive mechanism, by providing relative automotive services. Secondly, it would support multi-product and multi-market to meet the centralized clearing and settlement requirements of OTC market, broaden the service network of clearing members, enhance the data downloading/uploading service via member terminals, and improve the quality of multi-product cross-market clearing and settlement service, to prevent systemic risk.

Appendix 1

People's Bank of China Published Notice on Issues Concerning Renminbi Investments in the Inter-bank Bond Market in the People's Republic of China

The People's Bank of China (PBOC) has published a notice on relevant issues in relation to renminbi investments by three kinds of institutions in the Inter-bank Bond Market in the People's Republic of China on a pilot basis. The Notice has been issued in conjunction with the pilot programme of using renminbi to settle cross-border trades, and is intended to further facilitate and widen the channels for the backflow of offshore renminbi.

Amongst other things, the Notice includes the following provisions:

- The three kinds of competent institutions are offshore central banks or currency authorities (referred to as Offshore Central Banks), renminbi clearing banks in Hong Kong, China and Macau, China (referred to as renminbi Clearing Banks), and offshore participating banks for renminbi settlement of cross-border trades (referred to as Offshore Participating Banks). These three are referred to collectively as Offshore Institutions;
- Renminbi funds that are permitted to invest in the Inter-bank Bond Market shall come from currency cooperation between central banks, cross-border trades and investment in renminbi business;
- Offshore Central Banks and renminbi Clearing Banks may entrust Inter-bank Bond Market settlement agents, which have the capability of conducting international settlement business to trade and settle bonds. They may also apply to open a bonds account with the China Central Depository and Clearing Corporation, Limited directly and complete the relevant procedures with the National Interbank Funding Center;
- Offshore Participating Banks shall entrust Inter-bank Bond Market settlement agents, which have the capability of conducting international settlement business to trade and settle bonds;
- Offshore institutions shall open renminbi special accounts for the funds settlement of bond transactions—each institution is permitted to open only one renminbi special account; and
- Offshore institutions can only make investments within their approved quota, and are not permitted to trade bonds with their affiliate enterprises.

The Notice also applies to other offshore financial institutions that participate in cross-border services settled by renminbi on a pilot basis and use renminbi funds to invest in the Inter-bank Bond Market.

Hong Kong, China (HKG)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

The Hong Kong bond market is comprises mainly of over-the-counter (OTC) market, while a relatively small portion of bonds are listed and traded on the Hong Kong Stock Exchange.

The Central Moneymarkets Unit (CMU) serves as the central securities depository (CSD) in Hong Kong for debt securities involving Exchange Fund Bills and notes, government bonds, and debt securities issued by both public and private entities. The CMU is owned and operated by the Hong Kong Monetary Authority (HKMA), and also provides trade matching and bond settlement service for market participants. It also conducts end-of-day batch settlement on net basis, but does not act as a Central CounterParty (CCP).

Cash settlement is performed on the Clearing House Automated Transfer System (CHATS), a computer-based system in Hong Kong for electronic processing and settlement of interbank fund transfers. CHATS operates in a Real Time Gross Settlement (RTGS) mode between banks in Hong Kong, and is designed for large-value interbank payments. Banks using CHATS are connected to the clearing house computer operated by the Hong Kong Interbank Clearing Limited (HKICL). The HKMA, Hongkong and Shanghai Banking Corporation Limited (HSBC), Standard Chartered Bank (Hong Kong) Limited, and Bank of China (Hong Kong) Limited, respectively, serve as the Settlement Institution for the HKD, USD, EUR, and RMB RTGS systems under CHATS.

Please refer to Figure HK01 of Part 3: Diagram of Hong Kong, China Bond Markets.

1.2 Description of Related Organizations

The Hong Kong Monetary Authority (HKMA)

The HKMA was established on 1 April 1993 after the Legislative Council passed amendments to the *Exchange Fund Ordinance* in 1992 empowering the Financial Secretary to appoint a Monetary Authority. The powers, functions, and responsibilities

of the Monetary Authority are set out in the *Exchange Fund Ordinance*, the *Banking Ordinance*, the *Deposit Protection Scheme Ordinance*, the *Clearing and Settlement Systems Ordinance* and other relevant Ordinances. The division of functions and responsibilities in monetary and financial affairs between the Financial Secretary and the Monetary Authority is set out in an "Exchange of Letters" between them dated 25 June 2003. This Exchange of Letters also discloses the delegations made by the Financial Secretary to the Monetary Authority under these Ordinances.

The HKMA's main functions are:

- to maintain currency stability within the framework of the Linked Exchange Rate system;
- to promote the stability and integrity of the financial system, including the banking system;
- to help maintain Hong Kong's status as an international financial center, including the maintenance and development of Hong Kong's financial infrastructure; and
- to manage the exchange fund.

The HKMA is an integral part of the Hong Kong government. In its day-to-day work, the HKMA operates with a high degree of autonomy within the relevant statutory powers conferred upon, or delegated to, the Monetary Authority.

Hong Kong Interbank Clearing Limited (HKICL)
HKICL is a private company jointly owned by the HKMA and the Hong Kong Association of Banks (HKAB). HKICL was established in May 1995 to take over in phases the clearing functions provided by the former management bank of the Clearing House. The Hongkong and Shanghai Banking Corporation Limited (HSBC), and the process was completed in April 1997.

HKICL provides interbank clearing and settlement services to all banks in Hong Kong, and operates a central clearing and settlement system for public and private debt securities on behalf of the HKMA.

1.3 Trading

1.3.1 Over-the-Counter Market

Bonds in Hong Kong are primarily unlisted and traded over-the-counter (OTC).

1.4 CCP (Central Counterparty Clearing)

There is no CCP for the bond market in Hong Kong.

1.5 Bond Settlement

In Hong Kong, majority of bond transactions are conducted OTC, and cleared and settled through the CMU. The Settlement of bond transactions through the CMU is final and irrevocable. This finality is protected from insolvency laws and other laws by the Clearing and Settlement Systems Ordinance (CSSO).

The CMU is the debt securities clearing and settlement system in Hong Kong operated by the HKMA. Established in 1990, the CMU provides an efficient clearing,

settlement and custodian service for debt securities denominated in Hong Kong dollars and other major currencies. It also provides an electronic book-entry system, which eliminates the physical delivery of debt securities between CMU members. These debt securities include Exchange Fund papers, Government bonds, and debt securities issued by both public and private sector entities.

In December 1996, a seamless interface between the CMU and HKD RTGS system was established. Such linkage provides real-time and end-of-day delivery versus payment (DVP) services to CMU members. The CMU was further linked to the USD, euro, and RMB RTGS systems in December 2000, April 2003, and March 2006, respectively, to provide real-time DVP capability for debt securities denominated in these currencies, and also intraday and overnight repo facilities for their respective payment systems in Hong Kong.

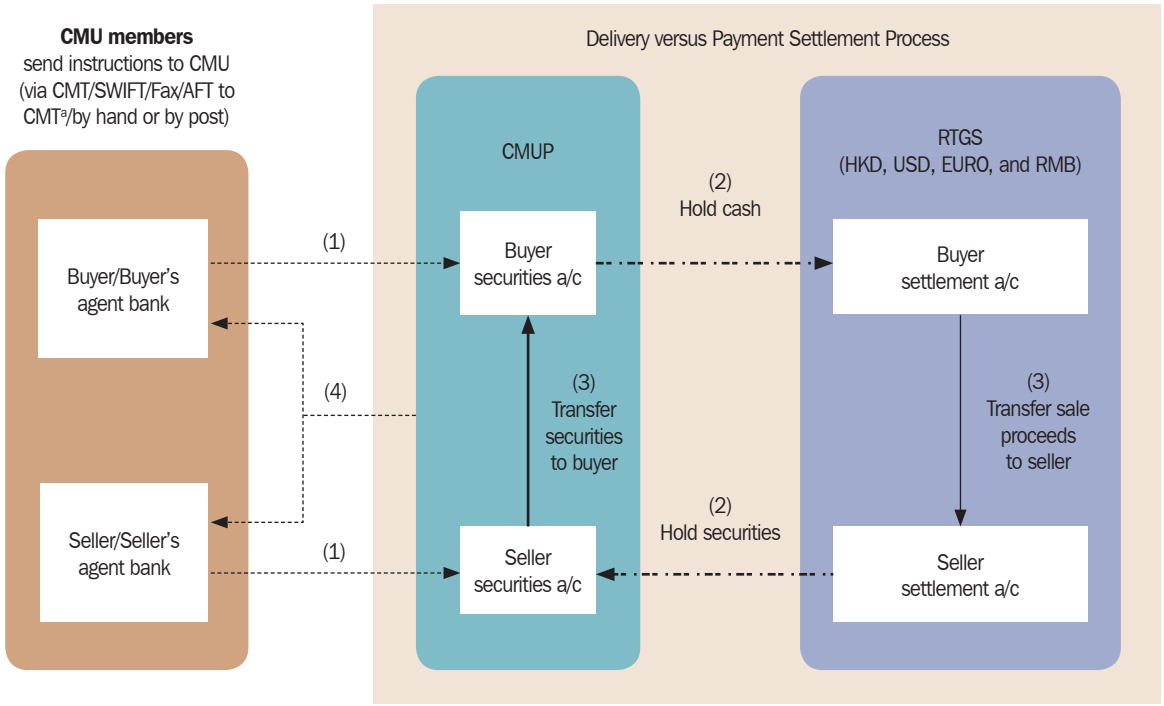
Through the seamless interface between the CMU and the HKD, USD, EUR, and RMB RTGS systems, securities transactions can be settled on real-time or end-of-day DVP basis in the CMU. For real-time DVP, both seller and buyer input instructions through its CMU Terminal or SWIFT. Once the instruction is matched, the 'matched' transaction will be stored in the system. The system will then look for the specific securities in the seller's account and put the securities on hold, after which an interbank payment message will be generated. After the payment initiated by the buyer is settled across the books of the HKMA or the Settlement Institution (SI), a confirmed message will be returned to the CMU and the securities held will be released to the buyer. If the seller does not have sufficient securities, the system will retry at a 15 minutes' interval until cut-off time by which all unsettled transactions are converted to end-of-day transactions and settled during the end-of-day settlement run. Likewise, if the buyer does not have sufficient funds in its cash accounts, the transactions are pending for settlement until sufficient funds are available in the buyer's accounts. If transactions cannot be settled before the cut-off time, the transactions are converted to end-of-day transactions and settled during the end-of-day settlement run.

For end-of-day transactions, securities and cash are settled on multilateral netting basis. At the settlement time of end-of-day settlement run, the system calculates the net settlement amount of both securities and cash for each member. The system will then check whether sufficient funds and securities are available for each member. If so, final transfers of both securities and cash for all members are effected simultaneously. Otherwise, all or part of transfer instructions of the members who do not have sufficient funds or securities will be cancelled before final end-of-day settlement takes place.

The settlement of government bond is performed on the CMU's book-entry system. CMU supports both real-time gross settlement (BIS Model 1) and end-of-day net settlement (BIS Model 3). Presently, over 90% of trades are settled on DVP basis. In terms of settlement arrangements, if the debt securities are settled using real-time DVP mode, both cash and securities legs are settled on gross basis. If the debt securities are settled using end-of-day DVP mode, both cash and securities are settled on net basis. If the securities are settled using free of payment (FOP) mode, settlement will be done in gross basis for real-time FOP or net basis for end-of-day FOP.

The settlement process for government bond trades (DVP) is illustrated as follows.

Figure 2.1 Settlement Process for Government Bond Trades



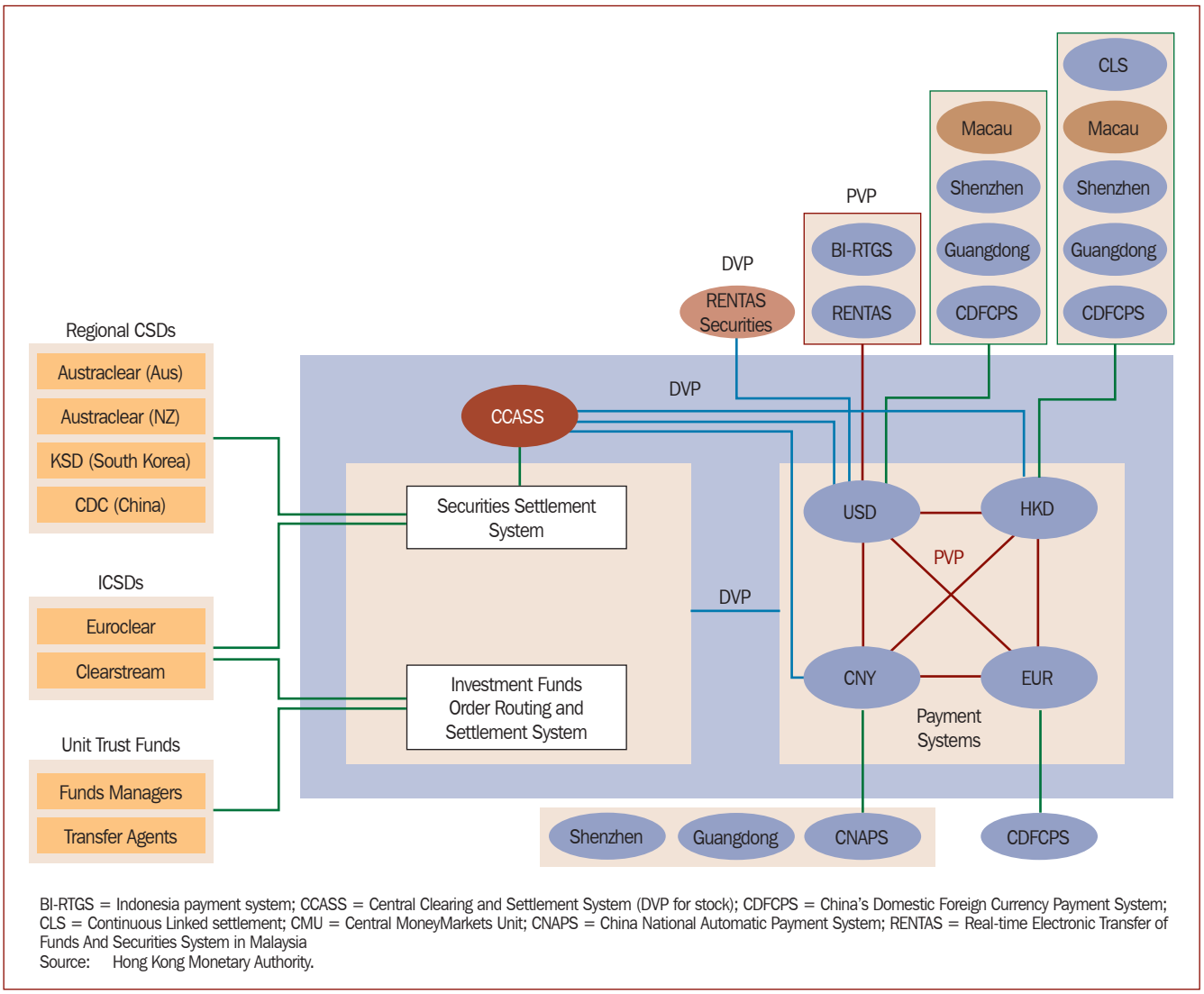
Notes: (1) Sending instructions to CMUP for validation and matching. (2) Once securities and cash are held, real-time delivery versus Payment settlement takes place in (3). (4) Confirmation send out. (a) By auto-feeding of concluded transactions on electronic trading platform (ETP) at Bloomberg to CMT for further processing (only applicable to registered dealers who have registered to ETP services with CMU)
Source: Hong Kong Monetary Authority.

CMU uses SWIFTNet as its network with participants. Types of lines are leased line and internet. Protocol is TCP/IP. Interfaces are SWIFTNet InterAct and InterBrowse. Message format is ISO15022.

Over the years, CMU has developed external links with regional CSDs and ICSDs. One-way inbound links from Euroclear and Clearstream, the two largest ICSDs in the world, to CMU were set up in 1994 to allow international investors to hold and settle Hong Kong dollar debt securities through these international networks. The linkages were further extended to two-way (bilateral) links in November 2002 (Euroclear) and January 2003 (Clearstream) to enable investors in Hong Kong and other parts of Asia to hold and settle Euroclear and Clearstream debt securities directly in a secure DVP environment via their CMU members.

Hong Kong's multi-currency payment and securities settlement infrastructure is illustrated as follows.

Figure 2.2 Hong Kong Multi-Currency Payment and Securities Settlement Infrastructure

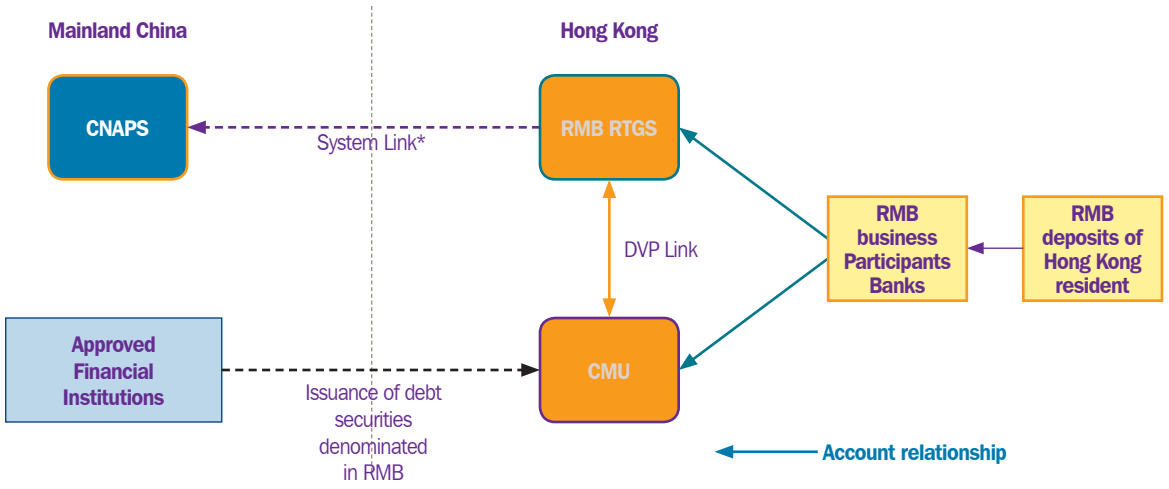


BI-RTGS = Indonesia payment system; CCASS = Central Clearing and Settlement System (DVP for stock); CDFCPS = China's Domestic Foreign Currency Payment System; CLS = Continuous Linked settlement; CMU = Central MoneyMarkets Unit; CNAPS = China National Automatic Payment System; RENTAS = Real-time Electronic Transfer of Funds And Securities System in Malaysia
Source: Hong Kong Monetary Authority.

CMU also established links with CDSs in Australia in December 1997, New Zealand in April 1998, and South Korea in September 1999. Apart from facilitating cross-border holding and settlement of debt securities in Hong Kong and overseas, they also enlarged the investor base, broadened the domestic debt markets, and reduced settlement risk by facilitating DVP settlement for cross-border securities transactions. HKMA and the China Central Depository and Clearing Co., Ltd. (CCDC) signed an agreement in April 2004 to establish a link between CMU and the Government Securities Book-entry System (GSBS) operated by the CCDC. This link enables authorised investors in Mainland China to hold and settle Hong Kong and foreign debt securities lodged in CMU. These links for Euroclear, Clearstream, New Zealand, and South Korea are bilateral. The others (for China and Australia) are unilateral. To be concrete, CMU has an account at Austraclear in Australia, and CCDC has an account at CMU.

The cross-border and cross currency trade is processed along the model that the following figures show.

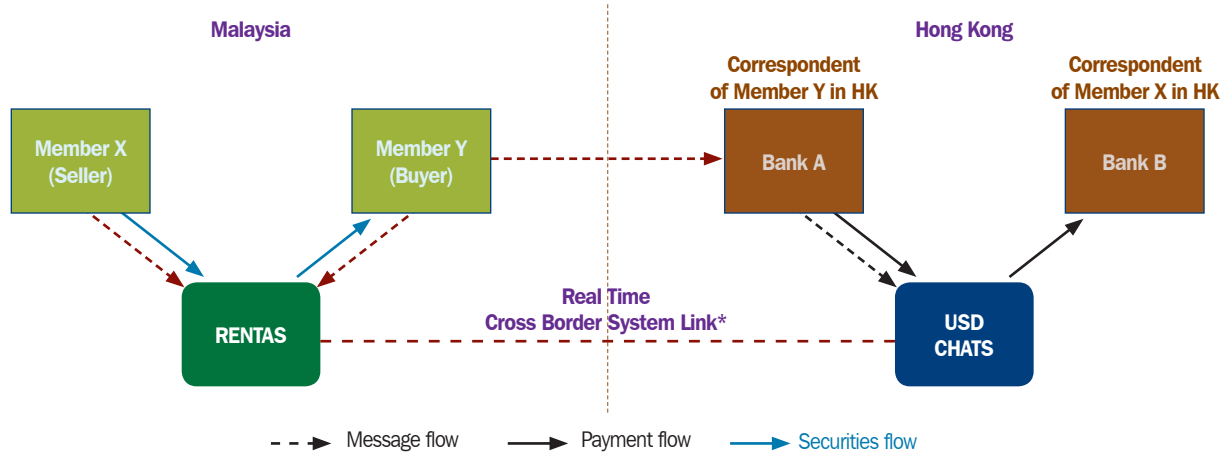
Figure 2.3 Cross-Border Cross-Currency Delivery-versus-Payment Model for Renminbi-Denominated Debt Securities Issued in Hong Kong, China



* The System Link between CNAPS in Mainland and RMB RTGS in Hong Kong, China is established through the Clearing Bank, Bank of China, Hong Kong (BoC, HK).
BoC = Bank of China; CMU = Central Moneymarkets Unit; CNAPS = China National Automatic Payment System (CNAPS); DVP = delivery versus payment; RMB = renminbi; RTGS = real-time gross settlement
Source: Hong Kong Monetary Authority.

Cross-border cross-currency DVP Model (denominated in USD) is illustrated as follows.

Figure 2.4 Cross-Border Cross-Currency Delivery-versus-Payment Model



* The RENTAS in Malaysia and USD RTGS system in Hong Kong, China are linked enabling real time DVP settlement mode for US dollar denominated securities in Malaysia.
DVP = delivery versus payment; HK = Hong Kong, China; RENTAS = Real-time Electronic Transfer of Funds and Securities; RTGS = real-time gross settlement; USD = US dollar
Source: Hong Kong Monetary Authority.

1.6 Cash Settlement

Cash settlement of bond transactions is carried out in CHATS. As mentioned in the section on bond settlement section above, for real-time DVP transactions, after the CMU put the required securities involved in a bond transaction in the seller's account on hold, an interbank payment message will be generated in CHATS. After the payment initiated by the buyer is settled across the books of the HKMA or the relevant Settlement Institution (SI), a confirmed message will be returned to the CMU and the securities held will be released to the buyer. If the buyer does not have sufficient funds in its cash accounts, the transactions will be pending for settlement until sufficient funds are available. In the event that the transaction cannot be settled before the cut-off time, the transaction will be converted to end-of-day transaction and settled during the end-of-day settlement run.

At the settlement time of end-of-day settlement run, the system calculates the net settlement amount of both securities and cash for each member. The system will then check whether sufficient funds and securities are available for each member. If so, final transfers of cash within CHATS and for securities are effected simultaneously. Otherwise, all or part of transfer instructions of the members who do not have sufficient funds or securities will be cancelled before final end-of-day settlement takes place.

To allow better liquidity management for banks via collateral management services, intraday repos and overnight repos are available for HKD, USD, EUR, and RMB RTGS systems while intraday overdraft is available for USD and EUR RTGS systems.[4]

Clearing House Automated Transfer System (CHATS) is a computer-based system established in Hong Kong for the electronic processing and settlement of interbank fund transfers. CHATS operates in a Real Time Gross Settlement (RTGS) mode between banks in Hong Kong and is designed for large-value interbank payments. Banks using CHATS are connected to the clearing house computer operated by the Hong Kong Interbank Clearing Limited (HKICL).

2. Typical Business Flows

2.1 DVP flow for OTC market

Please refer to Figure HK02 of Part 3: Business Process Flowchart of Hong Kong, China OTC market.

2.2 Cross-Border Flow

Please refer to Figure HK03 of Part 3: OTC Bond Transaction Flow for Foreign Investors (including cross-border, funding components).

3. Matching

3.1 OTC market

Pre-matching (including linkage transactions) is not a guarantee of settlement and does not commit either party to settlement. All FOP and DVP instructions,

[4] Intraday and overnight repos for RMB RTGS system were introduced on 21 February 2011.

except house transfer between participants own accounts, are required to undergo a matching process. Matching fields are at account level. DVP instructions have a settlement amount tolerance level of HKD10.

Both local matching and central matching are supported in Hong Kong, China. Local matching may save time and workload of input but may take the risk to accept incorrect materials input by the input party; central matching need more time for transaction entry and matching but can help identify trading errors more easily.

4. Settlement Cycle

CMU performs clearing and settlement for a variety of debt securities. The settlement cycle of each type of debt securities generally follows the standard cycle practice of that specific type of securities, and may differ among different types of debt securities. For example, the settlement cycles for Exchange Fund papers traded before and after 11 a.m. Hong Kong, China time are T+0 and T+1 respectively. The settlement cycle for Hong Kong government bonds is usually T+1 or T+2, while for corporate bonds and RMB bonds this is typically on T+2 basis.

5. Numbering and Coding

5.1 Numbering and Coding for OTC Market

5.1.1 Securities Numbering

The International Securities Identification Number (ISIN) is used for all securities numbering of bond transactions. The CMU system also supports the CMU Issue Number (i.e., local code) and Common Code.

5.1.2 Financial Institution Identification

A CMU Member Account Number is assigned by internal coding scheme in the CMU. There is no need to convert between ISO 9362 (BIC) and local codes because the system database can include both BIC and local codes.

5.1.3 Securities Account

ISO 20022 is not used for securities account. It is identified by proprietary coding scheme.

5.1.4 Cash Account

The International Bank Account Number (IBAN) code is not used for cash account. It is identified by the CMU member code (proprietary).

5.1.5 Character Code and Language

A character set supported by SWIFT is used for coding and language.

6. Medium- to Long-Term Strategies

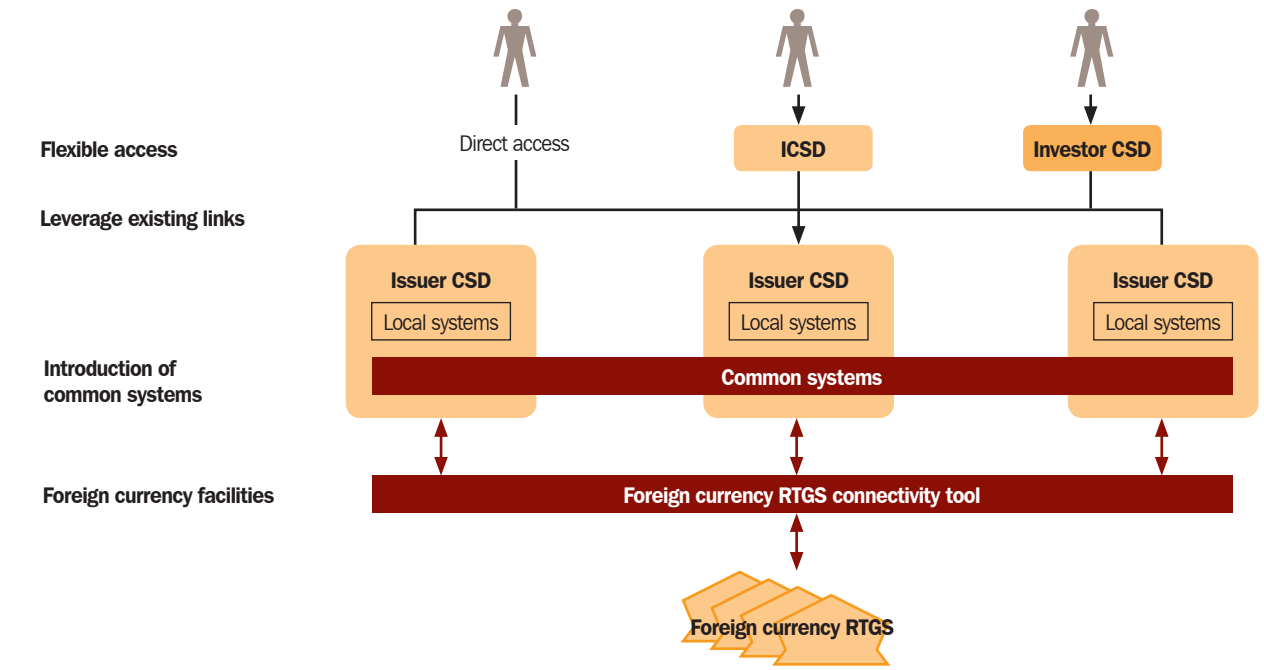
In terms of official initiatives to promote Straight through processing (STP) of bond trading, the HKMA encourages participants to trade Exchange Fund papers using the electronic platform. In particular, STP is promoted through FOP and DVP settlement for debt securities.

The biggest challenge for market members when it comes to STP involves the processing of cross-border transactions.

A Task Force comprising the HKMA, a group of central banks and central securities depositories (CSDs) in the Asian region, and Euroclear issued a White Paper in June 2010, recommending the development of a Common Platform Model in the long run to improve the cross-border post-trade clearing and settlement infrastructure for debt securities in Asia. One major objective of the Common Platform Model in vision is to introduce common systems and processes as well as common securities and corporate action database across markets in Asia to promote efficiency.

The conceptual framework of the Common Platform Model is illustrated as follows.

Figure 2.5 Conceptual Framework of the Common Platform Model



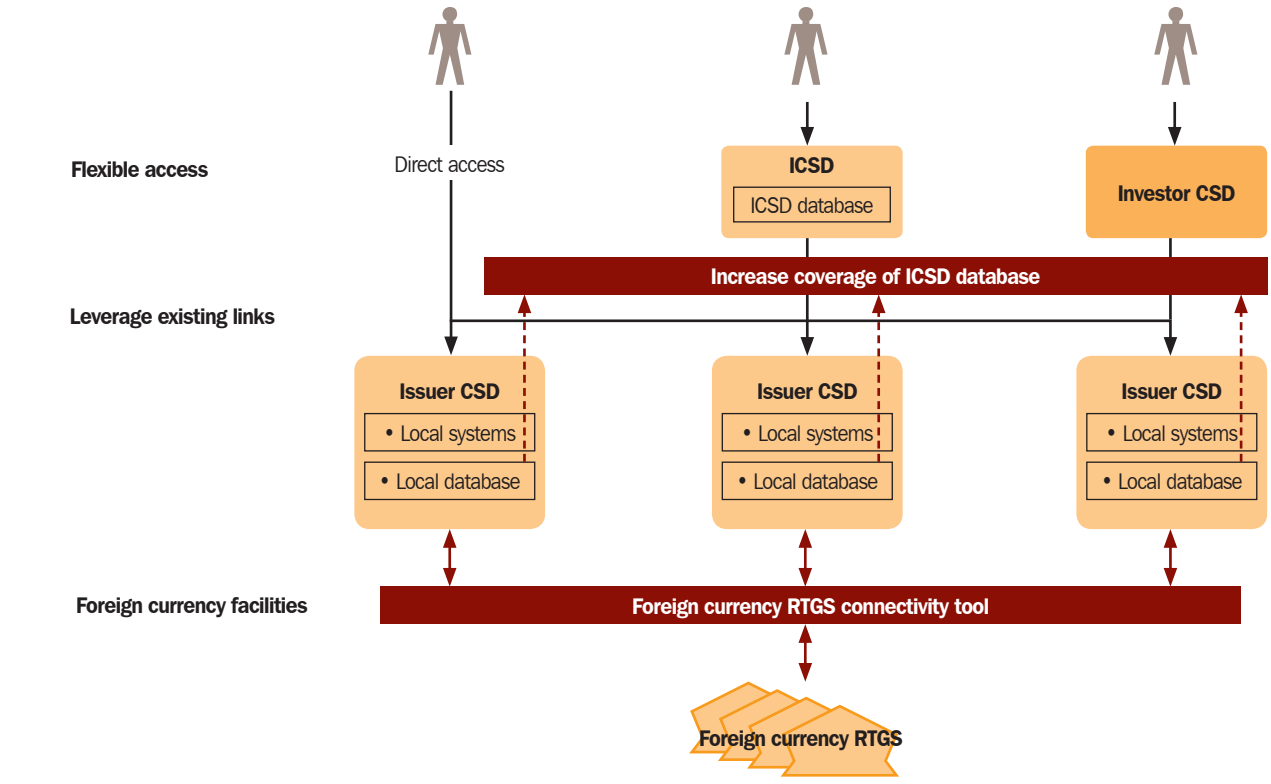
- New functions provided by the Common Platform.
CSD = central securities depository; ICSD = international central securities depository; RTGS = real-time gross settlement
Source: Hong Kong Monetary Authority.

Since it will take time and effort to introduce harmonized processes and common systems in Asia, the Task Force agreed to adopt a gradual approach and introduce the Pilot Platform as a tactical solution to deliver early benefits of the Common Platform

Model before its full implementation. The main objective of the Pilot Platform is to ensure that developments and changes in local practices, regulations and laws are kept at a minimal level, and that the Pilot Platform can bring in come quick wins with limited upfront investments and risks. The HKMA, together with Bank Negara Malaysia and Euroclear, will join the Pilot Platform as early movers. The Pilot Platform is expected to be launched in early 2012; currently, deliberation work is being conducted on possible add-on services (e.g., cross-border collateral management and corporate action servicing) to be provided following the launch of the Pilot Platform.[5]

Concept of the Pilot Platform is illustrated below.

Figure 2.6 Conceptual Framework of the Pilot Platform



- New functions provided by the Pilot Platform.
CSD = central securities depository; ICSD = international central securities depository; RTGS = real-time gross settlement
Source: Hong Kong Monetary Authority.

5 Hong Kong Monetary Authority. 2010. *Common Platform Model for Asia: A Collaborative Effort to Improve the Post-Trade Processing Infrastructure for Debt Securities in Asia.* http//:www.info.gov.hk/hkma/eng/public/qb201009/fa2.pdf; *Common Platform Model for Asian Post-trade Processing Infrastructure White Paper.* http://www.info.gov.hk/hkma/eng/infra/pan_asian/white_paper.pdf

Indonesia
(INO)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

The Indonesian bond market is comprised of the over-the-counter (OTC) and exchange markets. Government bonds are traded OTC, whereas corporate bonds are listed and traded on the Indonesia Stock Exchange (IDX). Corporate bonds can also be traded at the exchange using the Fixed Income Trading System (FITS). However, bond trading at the exchange is not popular, and almost all bonds—either government or corporate bonds—are traded in the OTC market. There are two central depositories handling bonds; Bank Indonesia (BI) handles government bonds, and the Indonesian Central Securities Depository (KSEI) handles corporate bonds, as well as government bonds (as a subregistry to BI). Settlement of the government bonds is performed on Bank Indonesia–Scripless Securities Settlement System (BI-SSSS). Cash settlement of government bonds is conducted on Bank Indonesia Real-time Gross Settlement (BI-RTGS). BI-SSSS and BI-RTGS are electronically linked on Bank Indonesia Real-time Gross Settlement (BI-RTGS). BI-SSSS and BI-RTGS are electronically linked. The settlement of government and corporate bonds in KSEI is performed in the Central Depositary and Book Entry Settlement (C-BEST) system, with cash settlement conducted via the appointed payment banks.. There is no clearing system on the OTC market.

On the other hand, for corporate bonds are traded in IDX using the FITS, the settlement is handled by KSEI with payments through the appointed payment banks. After trade matching, clearing is conducted on the Electronic Bond Clearing System (e-BOCS) and trade settlement is performed on the Central Depositary and Book Entry Settlement (C-BEST). The e-BOCS system is operated by Indonesia Clearing and Guarantee Corporation (KPEI), while the C-BEST system is operated by KSEI. Cash settlement is conducted by five appointed payment banks.

The market infrastructure diagram is shown in Part 3, Figure C.1.

1.2 Description of Related Organizations

The Indonesia Stock Exchange (IDX)

IDX is a private-owned limited company, whose shareholders are local stock-broking firms. IDX is the stock exchange in Indonesia and came into existence as a

mandate of Indonesian Capital Market and Financial Institution Supervisory Agency (BAPEPAM-LK) "Capital Market Master Plan 2005–2009," which stipulated the merger of Jakarta Stock Exchange (JSX) and Surabaya Stock Exchange (SSX).

The Indonesian Clearing and Guarantee Corporation (KPEI)
KPEI, Indonesia's central counterparty (CCP), was established in 1996 as a limited company to provide clearing and settlement, guarantee services for stock exchange transactions (equity, bonds and derivatives), and provide securities and borrowing.

Bank Indonesia (BI)
BI is the central bank of the Republic of Indonesia. BI acts as the central depository for the settlement and safekeeping of government bonds. Its role as the central registry of government bonds includes that of a registrar, settlement agent, and paying agent for coupon, interests and principal.

PT Kustodian Sentral Efek Indonesia (KSEI)
KSEI was granted a permanent operational license as a depository and settlement institution by the BAPEPAM-LK on 11 November 1998. KSEI's shareholders consist of the IDX, KPEI, custodian banks, securities companies, and registrars. KSEI started the settlement operations in scripless form beginning July 2000. Participants in the KSEI are custodian banks, securities companies and other parties approved by Bapepam-LK.

1.3 Trading

1.3.1 Over-the-Counter Markets

There is no formal OTC market in the Indonesian bond market; however, all government bonds can be traded off-exchange and traded directly between counterparties. Although all government bonds and corporate bonds are automatically listed on the IDX, most of trading is done OTC, and they must be reported to the exchange through their system called Centralized Trading platform (CTP) within 30 minutes after a trade is executed. The OTC market occupies a dominant position of bond trading (100%).

The centralized trading platform (CTP) is an electronic system established to facilitate the reporting of bond transactions. This system was introduced in September 2006 following the appointment of SSX as the Bond Transaction Reporting Center. Users of the CTP are securities companies and banks, which are obliged to report all their corporate and government bond transactions, as well as the transaction of their clients. After the merger, IDX takes over this role from SSX.

1.3.2 Exchange Markets

In June 2005, the stock exchange introduced FITS to facilitate the trading of bonds in the exchange. Bond trades in the exchange are handled through the e-BOCS, including allocations.

IDX provides Exchange Trade and OTC reporting as follows.

- **Bonds Exchange Trading System;**

Investor can order and trade bonds in this system via exchange member (currently only Securities Company) though there was no transaction in Bonds Exchange

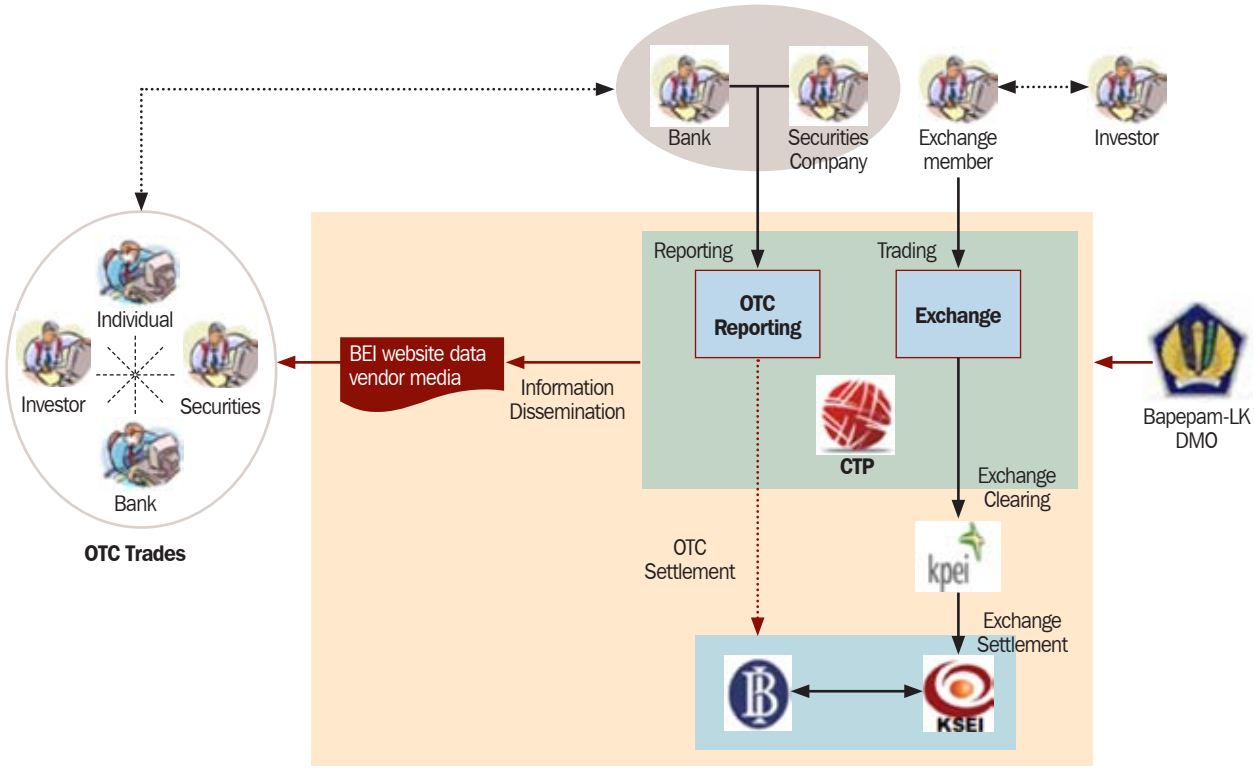
Trading System in 2011.

- **Bonds Transaction Reporting System;**

IDX has been appointed by Bapepam-LK and Indonesia SEC, as the Bonds Transaction Reporting Beneficiary, since 2006. Market player reports their OTC transaction to this system via banks and securities company. Market player have obligation to report these transaction to Bapepam-LK through Bonds Transaction Reporting System within 30 minutes.

Both systems can be used for government and corporate bonds.

Figure 3.1 Secondary Market Flow



Bapepam-LK = Badan Pengawas Pasar Modal dan Lembaga Keuangan; BEI = Bursa Efek Indonesia; CTP = Centralized Trading Platform; DJPU/DMO = Debt Management Office; OTC = Over-the-Counter; KPEI = Indonesian Central Counterparty; KSEI = Indonesian Central Securities Depository

Source: IDX.

1.4 Central Counterparty Clearing

1.4.1 Central Counterparty Clearing for the Over-the-Counter Market

There is no clearing system on the OTC market.

1.4.2 Central Counterparty Clearing for the Exchange Market

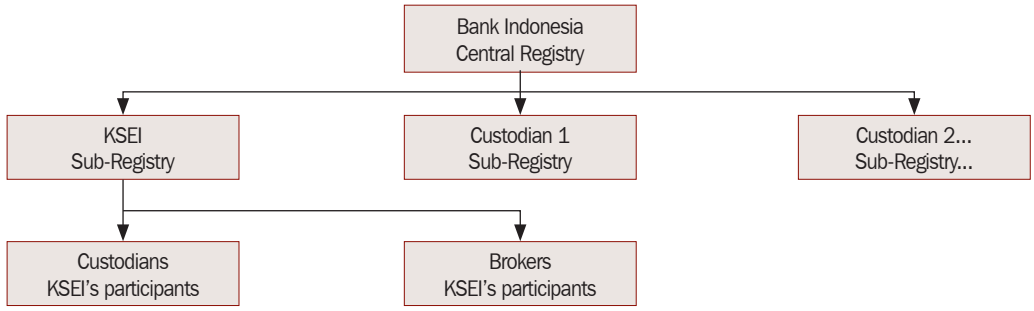
The KPEI has operated e-BOCS since 2006. e-BOCS is the system to settle all bond transactions executive in the IDX. This clearing mechanism shortens the settlement of bonds obligations and also increases efficiency of settlement.

1.5 Bond Settlement

1.5.1 Bond Settlement Traded at Bank Indonesia–Scripless Securities Settlement System

For government bonds, BI is currently appointed as the central registry to handle government bonds, while KSEI and other custodians are sub-registries under BI. Currently, BI maintains only one omnibus account for each sub-registry. Brokers and some custodians, which are not sub-registries of BI, settle and deposit their government bonds to KSEI as the central depository. The registry system of Indonesian government bonds is illustrated as follows.

Figure 3.2 Registry System of Indonesian Government Bonds



KSEI = PT Kustodian Sentral Efek Indonesia
Source: Indonesian Central Securities Depository.

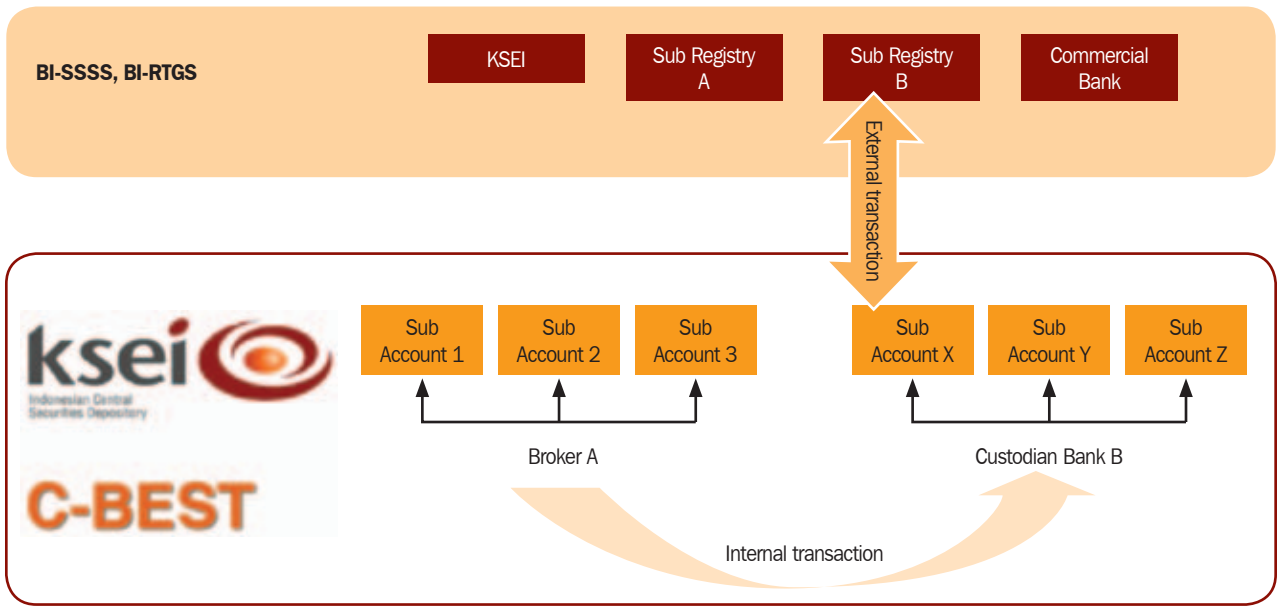
Settlement of government bonds is through BI-SSSS, which has been implemented since 16 February 2004. Under BI-SSSS, settlement of government bonds can only be performed on delivery-versus-payment (DVP) basis. This means that government bonds are not allowed to be settled on a free-of-payment (FOP) basis, unless it is a transfer for the same beneficial owner, grant, settlement of court, and lending and borrowing. BI-SSSS adopts DVP Model 1 of the Bank for International Settlement (BIS) models.

BI-SSSS's network is a proprietary network. The types of lines are leased line and dial-up. Its protocol is Systems Network Architecture (SNA) while its interfaces are proprietary (file transfer protocol [FTP]) and socket. The message format is proprietary.

1.5.2 Bond Settlement Traded at Central Depository and Book-Entry Settlement

The settlement of corporate bonds is performed on KSEI's C-BEST. C-BEST enables the settlement of government bonds for all market players who have a security account in KSEI but are not sub-registries of BI-SSSS. There is no different procedure for trading government bonds on the exchange market and OTC. KSEI participants have access only to C-BEST but C-BEST is directly connected to BI-SSSS, and automatically delivers or receives messages concerning settlement processes in BI-SSSS automatically delivers or receives messages concerning settlement processes in BI-SSSS; therefore, participants of KSEI can monitor transaction status, balance position, and obtain reports with C-BEST. Transaction status in C-BEST is available for viewing and may be downloaded every 15 minutes. C-BEST adopts DVP Model 2 of the BIS settlement models. Government bonds settlement between BI-SSSS and C-BEST is illustrated as follows.

Figure 3.3 Government Bonds Settlement between BI-SSSS and C-BEST



BI-SSSS = Bank Indonesia-Scripless Securities Settlement System; C-BEST = Central Depository and Book-Entry Settlement; KSEI = PT Kustodian Sentral Efek Indonesia; BI-RTGS = Bank Indonesia Real-time Gross Settlement
Source: Indonesian Central Securities Depository (KSEI).

1.6 Cash Settlement

Participants in the BI-SSSS utilize central bank money for bond settlement. BI-SSSS and BI-RTGS owned by BI are directly connected to execute DVP settlement. Overdraft is not permitted for foreigners.

Participants in the KSEI, on the other hand, utilize commercial bank money. KSEI have appointed four cash settlement banks: PT Bank Mandiri Tbk (BMRI), PT Bank CIMB Niaga Tbk (BNGA), PT Bank Central Asia Tbk (BBCA), and PT Bank Permata Tbk (BNLI). Overdraft is not permitted for foreigners, but intraday facility is allowed provided the intraday is supported with a proof of incoming funds or delivery settlement instruction. Custodians provide intraday facility to their selected clients for settlement purposes.

2. Typical Business Flows

2.1 Delivery-Versus-Payment Flow for the Over-the-Counter Market

Part 3, Figure C.2 illustrates the bond transaction flow for domestic trades (OTC market and DVP).

2.2 Delivery-Versus-Payment Flow for Cross-Border Bond Transactions

Bond transaction flow for foreign investors in the OTC market (DVP) is illustrated in Part 3, Figure C.3.

3. Matching

BI-SSSS provides central matching as settlement matching for bond transactions traded on the OTC market. The seller enters the DVP instruction as bond settlement instruction and the buyer enters the receive-versus-payment (RVP) instruction to BI-SSSS. BI-SSSS then compares the DVP and RVP instructions. When the message items of the instructions are completely the same, the status is regarded as matched. If there is discrepancy between the instructions, the status is regarded as mismatched. If one of the instructions is not yet entered, the status is regarded as unmatched.

4. Settlement Cycle

There is no fixed settlement period for bonds in the OTC market. The settlement date is usually negotiated and agreed at the time of the deal by the trading counterparties, and is generally T+2 or T+3. Market participants may discuss the shortening of the settlement cycle.

5. Numbering and Coding

5.1 Numbering and Coding for the Over-the-Counter Market

5.1.1 Securities Numbering

Local code is commonly used in the local market other than the International Securities Identification Number (ISIN) code.

5.1.2 Financial Institution Identification

A local code is used for foreign institution identification.

5.1.3 Securities Account

Local securities account numbering is used.

5.1.4 Cash Account

Local cash account numbering is used.

5.1.5 Character Code and Language

UTF-8 is used for BI-SSSS, C-BEST and BI-RTGS.

6. Medium- to Long-Term Strategies

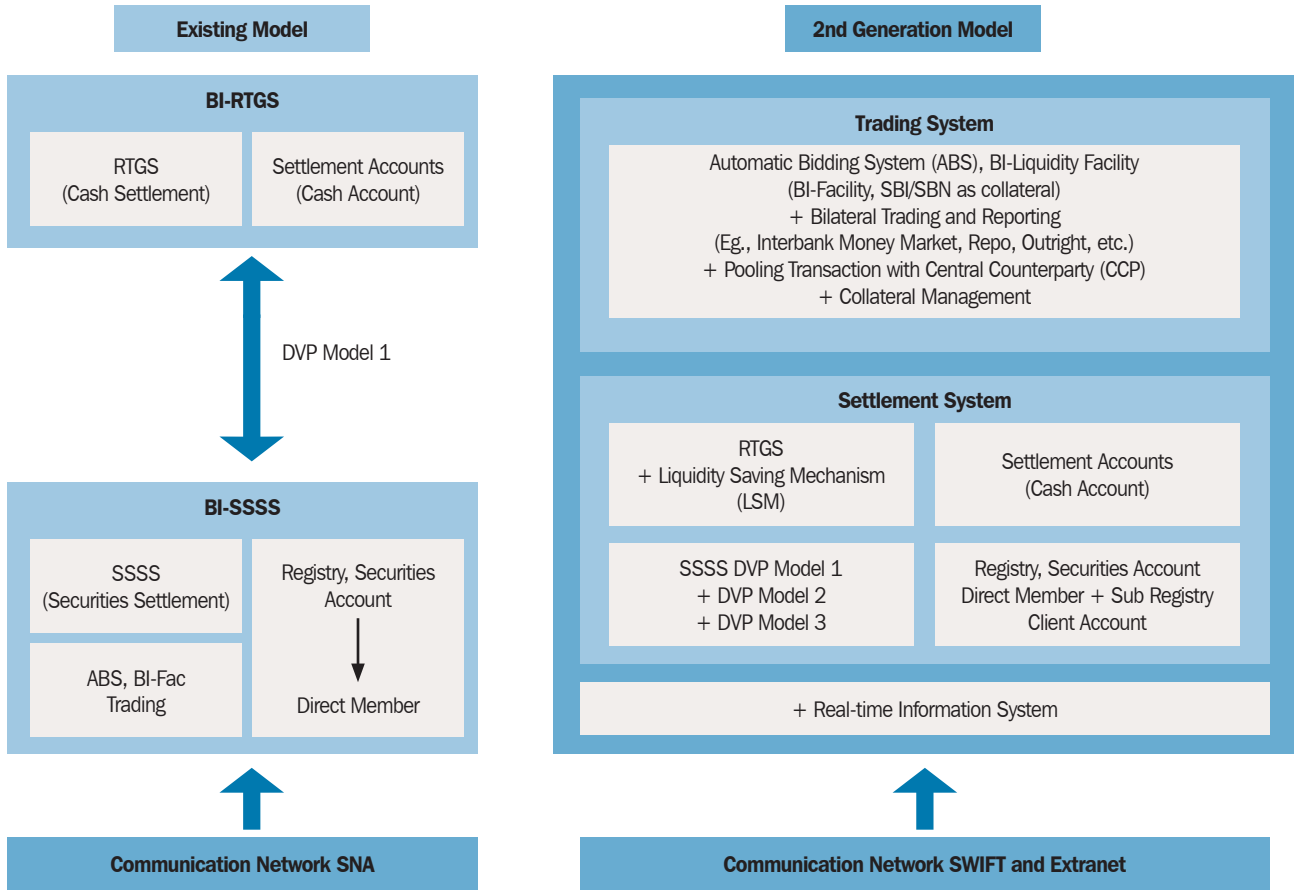
BI as the central registry for government bonds maintains an electronic registration. Therefore, the settlement processes of government bonds are STP. One of the current challenges in the Indonesian bond market is how to encourage market participants to use a centralized platform for bond trading.

Regarding new initiatives, firstly, BI plans to implement a second-generation system, which will replace the existing model that includes BI-SSSS and BI-RTGS. It will consist

of two systems—the trading system and settlement system. The second-generation model system will be implemented in 2012. Figure 3.4 illustrates the comparison between the existing system and the proposed second-generation system.

Enhancing interoperability between BI-SSSS and C-BEST is another initiative being undertaken by the BI. Particularly, emphasis is placed issues of interface, standardization (e.g., ISIN), tier system, single investor identity, and synchronization.

Figure 3.4 Comparison between the Existing System and the Second-Generation System



ABS = Automatic Bidding System; BI-Fac = Bank Indonesia-Liquidity Facility; BI-SSSS = Bank of Indonesia-Scripless Securities Settlement System; BI-RTGS = Bank Indonesia Real-time Gross Settlement; CCP = Central Counterparty; C-BEST = Central Depository and Book-Entry Settlement; KSEI = PT Kustodian Sentral Efek Indonesia; LSM = liquidity saving mechanism; SBI = Bank Indonesia Certificates; SBN = Government Securities (Indonesia); SNA = Systems Network Architecture
Source: Bank Indonesia.

The road map to implement the second-generation system is as follows.

Table 3.1 Road Map for the Implementation of Second-Generation System

Year	Activities
2008	• Grand Design • Business Requirements • Market Liquidity and Financial Market Deepening
2009	• Request for Proposal (RFP) • Product Evaluation • Procurement Process
2010	• Procurement Process • Dissemination of Participants and other Stakeholders • Formulation of Regulation
2011	• Formulation of Functional Specifications and Design Specifications • Development (Product Customization) • Dissemination of Participants and other Stakeholders • Formulation of Regulations (BI Regulation and Circular Letter)
2012	• Testing (Unit Test, SIT, UAT, UIT, Simulation/Industrial Test) • Dissemination to Participants and other Stakeholders • Formulation of Regulations (BI Regulation, Circular Letter, SOP, guidance) and By-laws • Training for Participants • Preparation for Implementation • Implementation

SIT = System Integration Test; SOP = Standard Operating Procedure; UAT = User Acceptance Test; UIT = User Integration Test
Source: Bank Indonesia.

Japan (JPN)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

There are two major bond markets in Japan, which are the over-the-counter (OTC) market and the securities exchange market. The exchange market is operated by the Tokyo Stock Exchange (TSE). Most bonds are traded on the OTC market. The pre-settlement matching system (PSMS) is provided by the Japan Securities Depository Center, Incorporated (JASDEC) for all types of debt securities traded on the OTC market. However, some transactions go directly to the central securities depositories (CSDs). Regarding clearing systems, the Japan Government Bond Clearing Corporation (JGBCC) is the central counterparty (CCP) for Japanese government bonds (JGB); Japan Securities Clearing Corporation (JSCC), which was established by the TSE and four other securities exchanges, and the Japan Securities Dealers Association, are clearing organizations that conduct the Financial Instruments Obligation Assumption Business under the *Financial Instruments and Exchange Law*. There are two CSDs in the Japan bond market: Bank of Japan (BOJ), which operates the BOJ-NET and is the CSD of JGBs, and JASDEC, which is the CSD for all other securities in Japan. All securities can be settled with central bank money (Japanese yen) using delivery versus payment (DVP). These descriptions are mainly about bond transactions in the OTC market. Part 3, Figure D.1 illustrates the bond market infrastructure diagram.

1.2 Description of Related Organizations

The Japan Securities Depository Center, Incorporated (JASDEC)

JASDEC was founded on 6 December 1984 as a non-profit foundation and began operations on 9 October 1991. It was incorporated on 4 January 2002 and began operations as a stock company, JASDEC Incorporated, on 17 June 2002. The stock company is owned by its depository participants, which include securities companies, banks, insurance companies, securities finance companies, and stock exchanges.

The Tokyo Stock Exchange (TSE)

TSE is a stock corporation that provides an exchange securities market under the authorization of the Prime Minister. TSE is a central institution in the secondary

market and its major functions include provision of a market place, monitoring trading, listing securities, monitoring listed securities, and supervision of trading participants.

The Japan Government Bond Clearing Corporation (JGBCC)
JGBCC was established through a joint capital investment by major market participants, namely securities companies, banks and money-market brokerage companies to enhance the safety, efficiency of, and convenience in the Japanese government bond market.

Japan Securities Clearing Corporation (JSCC)
JSCC was established in 2002 as the first cross-market clearing organization in the Japanese securities market by the TSE, Osaka Securities Exchange, Nagoya Stock Exchange, Sapporo Securities Exchange, Fukuoka Stock Exchange, and the Japan Securities Dealers Association. In January 2003, JSCC was licensed as the first clearing organization in Japan to conduct the securities obligation assumption business now called the financial instruments obligation assumption business under the *Securities and Exchange Law* (now called the *Financial Instruments and Exchange Law*).

Bank of Japan (BOJ)
BOJ is the central bank of Japan. BOJ deals with the entire business of JGBs, namely issuance, interest payment, and redemption. BOJ is also the central depository of JGBs. Settlement of funds and Japanese Government Securities arising from the above operations are facilitated by the BOJ Financial Network System (BOJ-NET).

1.3 Trading

Bonds are mostly dealt in the OTC market. The seller and buyer trade through telephone, fax, the Proprietary Trading System (PTS), or systems operated by information vendors.

JASDEC provides PSMS for all types of debt securities, though some transactions go directly to the CSDs. It also serves a pre-settlement matching function for clearing and DVP settlement, and post-trade matching function.

1.4 Central Counterparty

Approximately 40% of JGB market domestic transactions are cleared by the JGBCC, which is the CCP for JGB.[6] JGBCC replaces a contract between two parties to a JGB trade with two contracts: one between JGBCC and the buyer, and the other between JGBCC and the seller. Cash and securities positions between JGBCC and participants are netted and settled on a DVP basis using BOJ-NET. Netting reduces the value of JGB transfers to roughly a quarter of the value of the original transactions. JSCC is the CCP for exchange market transactions.[7]

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6 Cross-border transactions are processed directly by the CSD (BOJ-NET) without using the CCP (JGBCC).

7 The transactions traded on the TSE are cleared by JSCC. JSCC plays a role in assuming obligation, guarantee settlement, netting funds and securities for transfer, and instructing a settlement facility for transfer. JSCC stipulates the criteria for the qualifications to become clearing participants, to whom JSCC acts as the counterparty of the obligations. In addition, JSCC establishes a scheme to guarantee settlements in place, as well as performs the DvP settlement between clearing participants and the JSCC.

1.5 Bond Settlement

1.5.1 Bond Settlement for Government Bond Market

The BOJ is the CSD of JGBs. It operates the BOJ-NET, an online network system linking BOJ and other financial institutions. The BOJ-NET is used for funds transfer services, as well as JGB-related services, including settlement and other services, namely auction and initial payments for the issuance of JGBs. The business application of the BOJ-NET for JGB-related services is called BOJ-NET JGB Services. BOJ-NET JGB Services started operation in 1990 to enable online processing of JGB-related services.

BOJ-NET's network is also called BOJ-NET. The type of line used is VPN. The protocol used is TCP/IP.

1.5.2 Bond Settlement for Other Types of Bond Market

JASDEC is the central depository for all types of bonds, except JGBs. Under the dematerialized system, it is compulsory for all listed securities to be transferred on JASDEC's Book-Entry Transfer System. Transaction settlement includes securities only, with cash settling separately through the BOJ.

The book-entry transfer system is called the JASDEC network. Types of lines are Integrated Services Digital Network (ISDN) and leased line. The protocol is TCP/IP while the interface used is Common Object Request Broker Architecture (CORBA). Message formats are ISO 15022 and comma separated values (CSV).

1.6 Cash Settlement

Cash settlement of bond transactions uses central bank money. For cash settlement obligations for domestic bond transactions, JGBCC has an account with the BOJ.

Intraday overdraft is allowed, provided that there is a collateral to secure debt incurred as a result of use of the intraday overdraft facility. The liquidity-saving feature of the BOJ-NET real-time gross settlement (RTGS) system enables the smooth settlement of bond transactions.

2. Typical Business Flows

2.1 Delivery-Versus-Payment Transaction Flow for Domestic Japanese Government Bond Trade (OTC Market)

The data are entered to BOJ-NET from both seller and buyer, and settled simultaneously. Delivery-versus-payment (DVP) settlement is effected by locking all related accounts and releasing them simultaneously. The bond transaction flow for domestic trades in the OTC market (DVP) for JGBs is illustrated in Part 3, Figure D.2.

2.2 Delivery-Versus-Payment Transaction Flow for Cross-Border Japanese Government Bonds Trade

Trade order is placed from a foreign institutional investor (FII) to a global broker then to a domestic broker. The trade flow is a typical one as shown in Part 3, Figure D.3.

Japan is an open market where third party foreign exchange is entirely possible and used frequently. Japanese yen is available in international financial markets. Also, a global custodian, or even large FIIs or their investment managers, may have their own treasury function based in Tokyo. Thus, trades are funded into a domestic custodian a/c in Japanese yen on settlement day.

An initiative called "Towards Japan Securities Settlement Systems and Infrastructure Reform" established by the Securities Settlement System Reform Promotion Working Group, which was convened by the Committee for Reform of Securities Clearing and Settlement System, started in year 2000 to develop a more efficient, more accessible, and lower risk securities settlement system in Japan.

The bond transaction flow for foreign investors in the OTC market (DVP) is shown in Part 3, Figure D.3.

2.3 Delivery-Versus-Payment Transaction Flow for Domestic Japanese Government Bonds Trade in the Over-the-Counter Market after the New BOJ-NET

The New BOJ-NET will be made possible to be connected with PSMS and JGBCC. If the New BOJ-NET is connected with PSMS after establishment of the New BOJ-NET, the trade data are directly transmitted from PSMS to BOJ-NET.

An example of the DVP transaction flow which uses PSMS in the case that New BOJ-NET is connected with PSMS is shown in Figure JP04 of Part 3: Bond Transaction Flow for Domestic Trades: OTC Market (JGB)/DVP.

An example of the DVP transaction flow which uses PSMS and JGBCC in the case that New BOJ-NET is connected with PSMS and JGBCC is shown in Figure JP05 of Part 3.

2.4 DVP Transaction Flow for Domestic Corporate Bond Trade (OTC Market)

DVP transaction flow for domestic corporate bond trade is shown in Part 3, Figure D.6.

3. Matching

Pre-Settlement Matching System

The PSMS provides a framework for electronic matching on trades and settlements for institutional investor transactions between investment management companies, securities companies, trust banks, custodian banks, life and non-life insurance companies to achieve the seamless, automated processing of all operations from post trade through to settlement. Moreover, PSMS provides an advanced matching function for DVP book-entry transfer settlements conducted by JASDEC, as well as for clearing by the JGBCC. Please refer to Appendix 2. Some transactions are directly matched in the CSD (BOJ-NET), which provides local matching facility. Both seller and buyer enter trade data and the data are forwarded to the counterparty. If the data are correct, the counterparty will send them back to the BOJ-NET with an affirmative message.

A few variations of trade matching by PSMS are shown in Part 3, Figure D.7.

4. Settlement Cycle

The standard settlement cycle of domestic transactions is T+3. The settlement cycle of cross-border transactions is T+2~T+4. One reason for the difference is that business processes are different between domestic transactions and cross-border transactions. Cross-border transaction may require additional operations by the global and local custodians. Another reason is the time-zone differences between North America, Europe, and Japan.

The settlement cycle for outright DVP transaction will be shortened to T+2 beginning April 2012 for domestic transactions. An initiative to shorten settlement cycle is discussed later in the "Medium- to Long-Term Strategy."

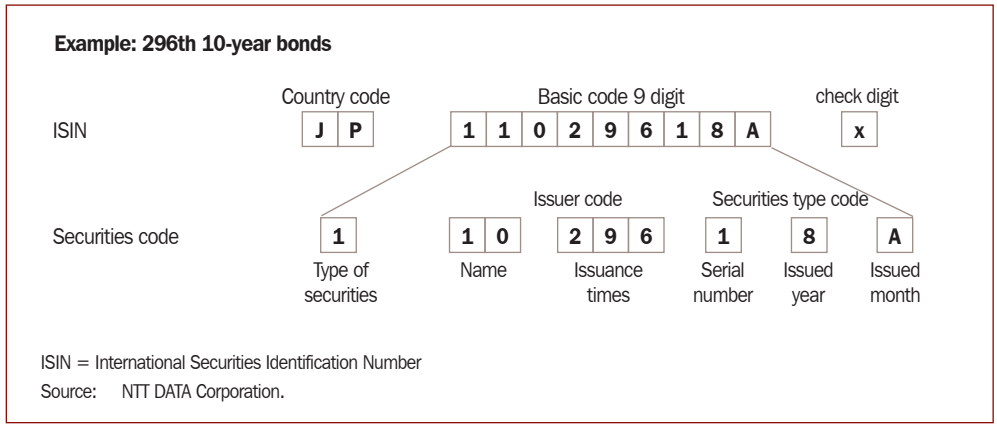
5. Numbering and Coding

5.1 Numbering and Coding for Over-the-Counter and Exchange Markets

5.1.1 Securities Numbering

The New BOJ-NET will adopt International Securities Identification Number (ISIN) as securities identification number. JASDEC has already adopted ISIN for bonds and it will be the standard for securities identification in Japan. A relationship between ISIN and local numbering is shown as follows.

Figure 4.1 Local Numbering Scheme and Codes for International Securities Identification Number

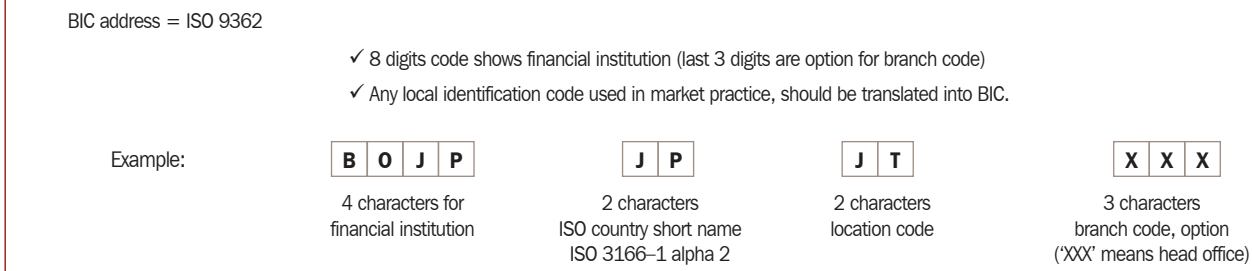


ISIN = International Securities Identification Number
Source: NTT DATA Corporation.

5.1.2 Financial Institution Identification

Currently, only proprietary financial institution identification codes are used in the CSDs for JGBs. New BOJ-NET will adopt the Business Identifier Code (BIC) in addition to the current proprietary codes.

Figure 4.2 Financial Institution Identification



BOJP = Bank of Japan; JP = Japan; JT =Tokyo
Source: NTT DATA Corporation.

5.1.3 Securities Account

Securities account uses practically proprietary numbering. The current proprietary account structure will be used for the New BOJ-NET. The following is a brief description of the account structure based on BOJ regulations on the JGB book-entry system.

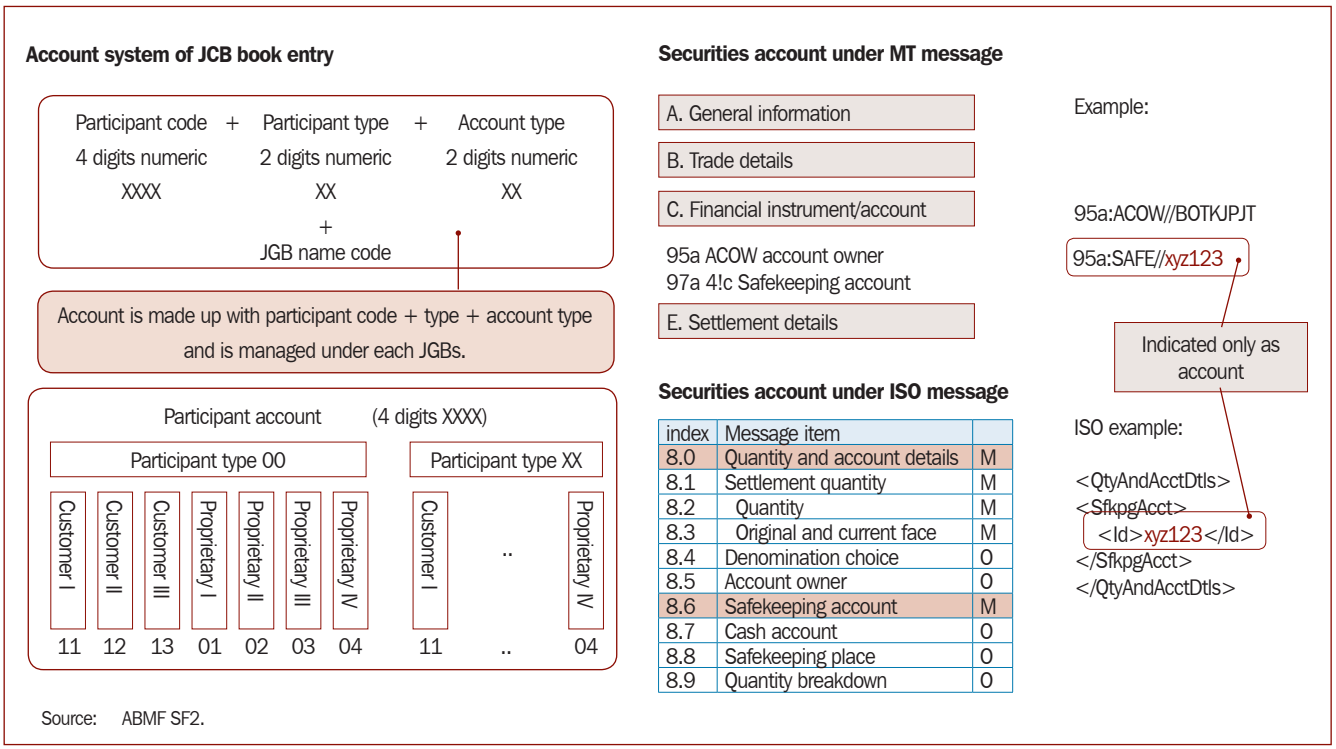
Divisions of Direct Participant's Account[1]

1. The Direct Participant's Account shall be divided into the following:
   a. The account into which the description or record of the book-entry JGBs to which the relevant Direct Participant holds the rights shall be made (hereinafter referred to as the "Direct Participant's Account [Proprietary ledger]"); and
   b. The account into which the description or record of the book-entry JGBs to which Customers of the relevant Direct Participant, or its Lower-Positioned Institutions, hold the rights shall be made (hereinafter referred to as the "Direct Participant's Account [Customer ledger]").
2. The Direct Participant's Account (Proprietary ledger) and the Direct Participant's Account (Customer ledger) shall have subdivisions for each Classification as separately provided by the BOJ. In such case, the Direct Participant's Account (Proprietary ledger) shall have a subdivision into which the book-entry JGBs, which are subject to a pledge, are described or recorded, and the other subdivision into which other book-entry JGBs are described or recorded.

1 Bank of Japan. 2009. Regulations concerning the Japanese Government Bonds Book-Entry System. http://www.boj.or.jp/en/paym/jgb_bes/data/fyoryo01.pdf

The securities account structure is illustrated as follows.

Figure 4.3 Securities Account Structure



index	Message item	
8.0	Quantity and account details	M
8.1	Settlement quantity	M
8.2	Quantity	M
8.3	Original and current face	M
8.4	Denomination choice	O
8.5	Account owner	O
8.6	Safekeeping account	M
8.7	Cash account	O
8.8	Safekeeping place	O
8.9	Quantity breakdown	O

Source: ABMF SF2.

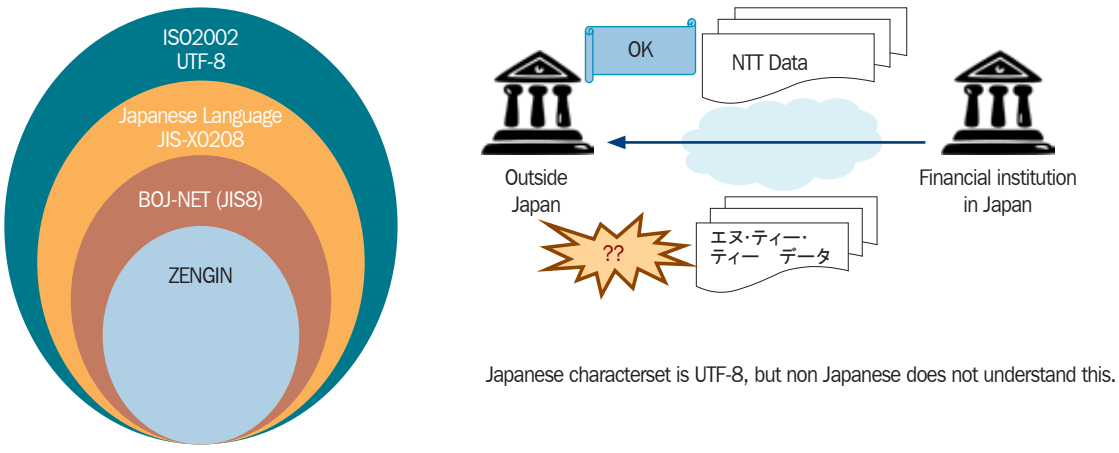
5.1.4 Cash Accounts

Cash accounts use practically proprietary numbering.

5.1.5 Character Code and Language

UTF-8 contains the Japanese settlement system's character set. The current BOJ-NET adopts Japanese Industrial Standards (JIS). The New BOJ-NET will adopt Unicode using UTF 8 as the encoding scheme. The language for the New BOJ-NET will be Japanese. Image of character code sets and language are illustrated in Figure 4.4.

Figure 4.4 Character Code Sets and Language in the Japanese Settlement System



Source: NTT DATA Corporation.

6. Medium- to Long-Term Strategies

Regarding message standardization compliance with ISO 20022, JASDEC will introduce ISO 20022 message formats in 2014 not only to PSMS but also to Book-Entry Transfer Systems. JASDEC will also introduce SWIFTNet by 2014, and will terminate the customized ISO 15022 message format by 2019.

The BOJ will adopt ISO20022 message formats for some transactions under the new BOJ-NET, which will start operating for some areas around the first quarter of 2014 and the remaining areas between the autumn of 2015 and the beginning of 2016.

On the matter of settlement cycle, a working group tasked to shorten the settlement cycle for Japanese government bonds was established in September 2009 under the Reform Promotion Center for Securities Clearing and Settlement System, with the Japan Securities Dealers Association serving as the secretariat of the working group.

By April 2012, the settlement cycle will be T+2. Discussion on the introduction of T+1 will restart in the second half of FY 2012.

Appendix 2:

Pre-Settlement Matching System

I. Introduction

The Pre-Settlement Matching System (PSMS) provides a framework for electronic matching on trades and settlements for institutional investor transactions between investment management companies, securities companies, trust banks, custodian banks, life and non-life insurance companies, and other actors in the bond market to achieve a seamless, automated processing of all operations from orders to settlement. Moreover, PSMS provides an advance-matching function for delivery-versus-payment (DVP) book-entry transfer settlements conducted by the Japan Securities Depository Center Incorporated (JASDEC), as well as for clearing by the Japan Government Bond Clearing Corporation (JGBCC).

A. Straight Through Processing for Securities Settlement in Japan

As far as institutional transactions are concerned, it is quite common that institutions that perform investments and those that perform settlement are different entities not only in Japan but also in other countries. In Japan, however, it is typical for trust banks to retain the rights and obligations. For this reason, PSMS was developed to realize the straight through processing (STP) suitable to the specifics of the securities settlement environment in Japan.

B. Establishment and Application of Japanese Standards in Conformity with Global Standards

Securities markets have been globalized so quickly. Until recently, securities settlement systems used to be constructed on the vernacular architecture of data syntax and codes, which can be only used in the domestic market; connectivity with overseas counterparts must be incorporated in future settlements system. To achieve this, the PSMS was developed based on the following standard data syntax and codes:

1. **Data Syntax: ISO 15022.** This data syntax was originally developed for the Society for Worldwide Interbank Financial Telecommunication (SWIFT) network as the new securities data syntax to be used beginning in autumn of 2002 and then registered with the International Organization for Standardization (ISO) as ISO 15022. ISO 15022 became the common syntax for financial institution worldwide and replaced ISO 7775, which was widely used by financial institutions all over the world. Using this data syntax makes it possible, for example, to transmit settlement instructions sent from global custodians to Japanese sub-custodians easily to the PSMS. Because of the scalable architecture of ISO 15022, it is also expected to assure the scalability of PSMS to meet future increases in the scope of securities to be handled and the diversification of types of trades.
2. **The International Securities Identification Number.** The International Securities Identification Number (ISIN) is the standard code allocated by the Securities Identification Code Committee in conformity

with the International Securities Identification Code Standard (ISO 6166). All Japanese domestic stocks, as well as all bonds issued by public offering in Japan, are allocated with the ISIN "JP+ basic code+ check digit". ISIN is the only globally common code, since it is allocated by the securities identification code organization of each country in accordance with the International Identification Code Standard. The adoption of ISIN will assure the same effect as the adoption of ISO 15022 mentioned above.

3. **Business Identifier Code.** It is necessary to identify various participating parties, such as counterparties of trading and of settlement, in the PSMS by code numbers. The Business Identifier Code (BIC) is being used in the SWIFT network as the standard bank identifier code, such as the ISO 15022, and is registered with ISO as ISO 9362. To utilize the PSMS, it is necessary for all users such as banks, securities companies, investment trust companies, and investment advisory companies to obtain a BIC. In case it is not possible to obtain a BIC for some reason, other identifiers, such as the Uniform Bank Code or the Standard Code for Securities Company, will be used as a supplementary identification in the PSMS.

C. Matching on Trade Date (T+0 Matching)

While PSMS was implemented under the T+3 environment, this aims to complete the matching of trades on the trade date, T+0, to keep pace with the movement of the securities industry to a shorter settlement cycle, T+1. It is believed that completion of trade matching on T+0 will help increase convenience for investment trust management services. To be precise, open-end investment trust is required to calculate and announce the net asset value (NAV) every day, which should be done accurately and promptly. The PSMS provides facilities to match the investment instruction data sent by investment trust companies and trade report data sent by securities companies on a real-time basis, and then sends the matched data to trust banks. This enables trust banks to smoothly and accurately calculate the NAV and match such NAV calculated by investment trust companies more quickly and accurately.

D. Connecting to the Delivery-Versus-Payment System

On 17 May 2004, with the implementation of the delivery-versus-payment (DVP) system for trades other than stock exchange transactions, the PSMS linked to the Book-Entry Transfer System. The matched settlement instruction data linked to the Book-Entry Transfer System set in the PSMS is automatically transmitted to the Book-Entry Transfer System, thereby completing the settlement process without any manual interventions. The participation to PSMS is a requisite for putting the DVP settlement into practice.

E. Digitization and Dematerialization

Digitization of trade data and dematerialization or immobilization of securities is a prerequisite for bringing STP into operation. As a practical step, an amendment to the *Ordinance of the Cabinet Office* was issued on 1 October 2001, which allows securities companies to send trade reports to their customers in electronic or magnetic form through the PSMS, upon the agreement of customers.

F. The Average Price: The New Pricing Framework in Japan

On 7 July 2003, an amendment to the *Ordinance of the Cabinet Office* on securities companies and the members' notification of the Japan Securities Dealers Association (JSDA No. 15–33) relating to the average price were issued. This allowed securities companies not to send to their customers trade confirmations regulated by the *Securities and Exchange Law* under Art. 41. It also allowed sending trade reports, using an average price with the conditions such as agreement of customers, under the *Ordinance of the Cabinet Office* on securities companies. This amendment made it possible for securities companies to send trade reports using average price to their customers in the electronic or magnetic form through the PSMS.

G. Connecting to Japan Government Bond Clearing Corporation

Since May 2005, the Japan Government Bond Clearing Corporation (JGBCC) started the clearing business of Japan government bonds. At the same time, PSMS linked data to the JGBCC system. The matched trade-report data of Japanese government bonds linked to the JGBCC set in the PSMS is automatically transmitted to the JGBCC system; the PSMS receives data generated by the JGBCC system such as credit approval status, netting result, among others, and sends these data to JGBCC participants.

II. Domestic Transactions

A. Scope of Services

The PSMS is developed to perform the post-trade procedure mainly for institutional investor; thus, it covers both transaction types on the buy-side, consisting of investment managers (investment trust management companies and/or investment advisory companies) and trust banks, which perform matching for specified money trust transactions, and another buy-side consisting of institutional investors, such as life or non-life insurance companies and trust banks, which perform matching for their own transactions, known as the Proper Type. Further, the former buyer type can be categorized into three sub-types based on the difference of data-transmission method between the investment managers and the trust banks: 1) Three-party Center Matching Type (Without Using Investment Instruction Distribution Service), 2) Three-party Center Matching Type (Using Investment Instruction Distribution Service), and 3) Investment Instruction Support Unsubscribed. As far as bonds are concerned, PSMS provides two more transaction types: Through Type and Two-party Center Matching. Under the Through Type, the PSMS is not used for matching investment instruction data and trade report data while the Two-party Center Matching involves two parties confirming the result of a bilateral trade.

1. **Three-party Center Matching Type (Using Investment Instruction Distribution Service).** This type does not receive Investment Instruction Data from investment managers, but PSMS, on their behalf, generates Investment Instruction Data based on Trade Report Data sent from the securities companies, and transmits the data to the investment managers. After checking the contents of the data, investment managers send it back to the PSMS as Investment Instruction Data. Investment managers are able to replace the Notice of Execution by fax from securities companies by electronic data transmission.

2. **Investment Instruction Support Unsubscribed Type.** This type is used when investment managers do not participate in the PSMS and send Investment Instruction Data (or Investment Instruction Statement) to trust banks by some other means. In this case, trust banks receive only Trade Report Data sent by securities companies via PSMS, match Trade Report Data internally with Investment Instruction Data (or Investment Instruction Statement) received by some other systems or methods, and send the Trade Report Affirmation Data to the PSMS.
3. **Through Type.** This type is used when PSMS is not used for matching investment instruction data and trade report data. Investment instruction data from investment managers and trade report data from brokers or dealers are transmitted to trust banks, respectively. In this case, the trust banks match these two data internally and send the Trade Report Affirmation Data to the PSMS.
4. **Proper Type**. This type is used by the buy-side consisting of institutional investors, such as life or non-life insurance companies or trust banks who perform investments and settlement for their own transactions. As the party in the transaction in this case is only one, the matching process becomes simpler than specified money trust transactions, eliminating the transmission or receipt of Investment Instruction Data.
5. **Two-party Center Matching Type.** This type is used when two parties confirm the result of a bilateral trade, and both the seller and buyer send the trade report data to the PSMS, respectively. The PSMS executes matching of trade report data from the seller and the buyer and immediately transmits the Notice Data of Trade Matching Status.

B. Outline of Matching Process

The matching process for the Three-party Center Matching Type (Without Using Investment Instruction Distribution Service) is described below:

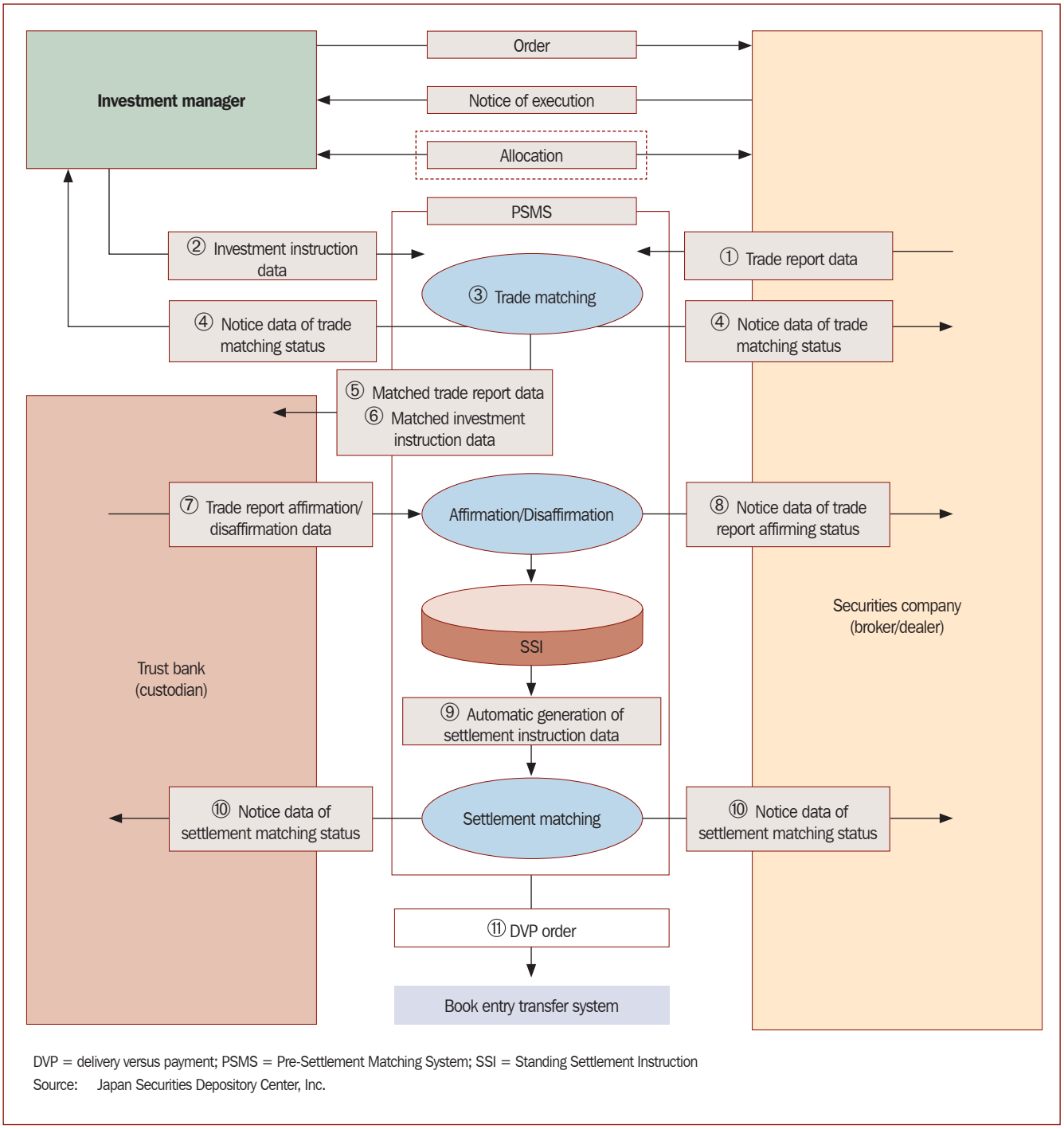
1. **Transmission of Trade Report Data and Investment Instruction Data.** As stated above, the Order from investment managers to securities companies, the Notice of Execution from securities companies to investment managers, and the allocation between investment managers and securities companies are beyond the scope of services. Service starts from the transmission of Trade Report Data from securities companies and Investment Instruction Data from investment managers. The data syntax used for Trade Report Data is MT515 of ISO 15022 and that for Investment Instruction Data is MT541/543 (Buy/Sell) (Figure A2.1 ① and ②).
2. **Matching of Trade Report Data and Investment Instruction Data (Trade Matching)** (Figure A2.1 ③). When the Trade Report Data and Investment Instruction Data are received, PSMS searches for the data to be matched in accordance with the matching logic. When the data to be matched are specified, the matching procedure takes place and the Notice Data of Trade Matching Status (MT509) are transmitted to the investment manager and the securities company (originators of matching data) in real-time, together with the status information of "Matched" or "Unmatched" (Figure A2.1 ④). In case the status information is "Unmatched", the reason for discrepancy and details of counterpart for unmatched item will be transmitted.

3. **Transmission of Trade Report Data and Investment Instruction Data to Trust Banks and Trade Report Affirmation /Disaffirmation Data** (Figure A2.1 ⑤, ⑥, ⑦, and⑧). When the data is matched, the Trade Report Data and Investment Instruction Data are immediately transmitted to the trust banks (Figure A2.1 ⑤ and ⑥). The trust banks then confirm the details of data and send out the Trade Report Affirmation or Disaffirmation Data ("Affirmed" or "Disaffirmed", MT517) (Figure A2.1 ⑦). Upon receipt of such data, the PSMS transmits the Notice Data of Trade Report Affirming Status to the securities companies (MT509) (Figure A2.1 ⑧). In case the status indicates "Disaffirmed" by the trust banks, securities companies (or/and investment managers) cancel the previously sent Trade Report Data (or/and Investment Instruction Data) and resend the corrected Trade Report Data (or/and Investment Instruction Data).[8]
4. **Generation of Settlement Instruction Data** (Figure A2.1 ⑨ and ⑩). When a Trade Report Affirmation or Disaffirmation Data sent by trust banks carries the "Affirmed" flag, the process moves to the generation of settlement instruction data.

   To realize the straight-through nature of the process, the PSMS provides the Standing Settlement Instruction (SSI) database to register settlement conditions such as key account information for all trading parties. By using this database, the PSMS automatically generates and transmits Settlement Instruction Data to the settlement matching unit, and eliminates manual efforts of creation and transmission of the settlement instruction data by trust banks and securities companies (Figure A2.1 ⑨). Then, the Notice of Settlement Matching Status Data (MT548) with "Matched" status will be sent to both parties (Figure A2.1 ⑩).
5. **Generation of Delivery-Versus-Payment Order**. When Settlement Instruction Data carrying a "LINK/DVP" is matching, the PSMS immediately prepares a Delivery-Versus-Payment (DVP) Order from the matched settlement instruction data of both deliverer and receiver and transmits the order to the Book-Entry Transfer System (Figure A2.1 ⑪).

8 As ISO 15022 does not have the function to correct data elements, or the re-submission of corrected specific element is not available, the cancellation of all elements of previously sent data and re-entry of the corrected data have to be transmitted.

Figure A2.1 Domestic Transactions–Three-Party Center Matching Type
(Without Using Investment Instruction Distribution Service)



DVP = delivery versus payment; PSMS = Pre-Settlement Matching System; SSI = Standing Settlement Instruction
Source: Japan Securities Depository Center, Inc.

III. Non-Residents' Transactions

A. Scope of Services

In case of non-residents' transactions, trade matching is not performed, but matching of Settlement Instruction Data sent from settlement agents, such as banks and securities companies who perform custody operations for Japanese securities traded by non-residents, is utilized (Figure A2.2).

B. Outline of the Matching Process

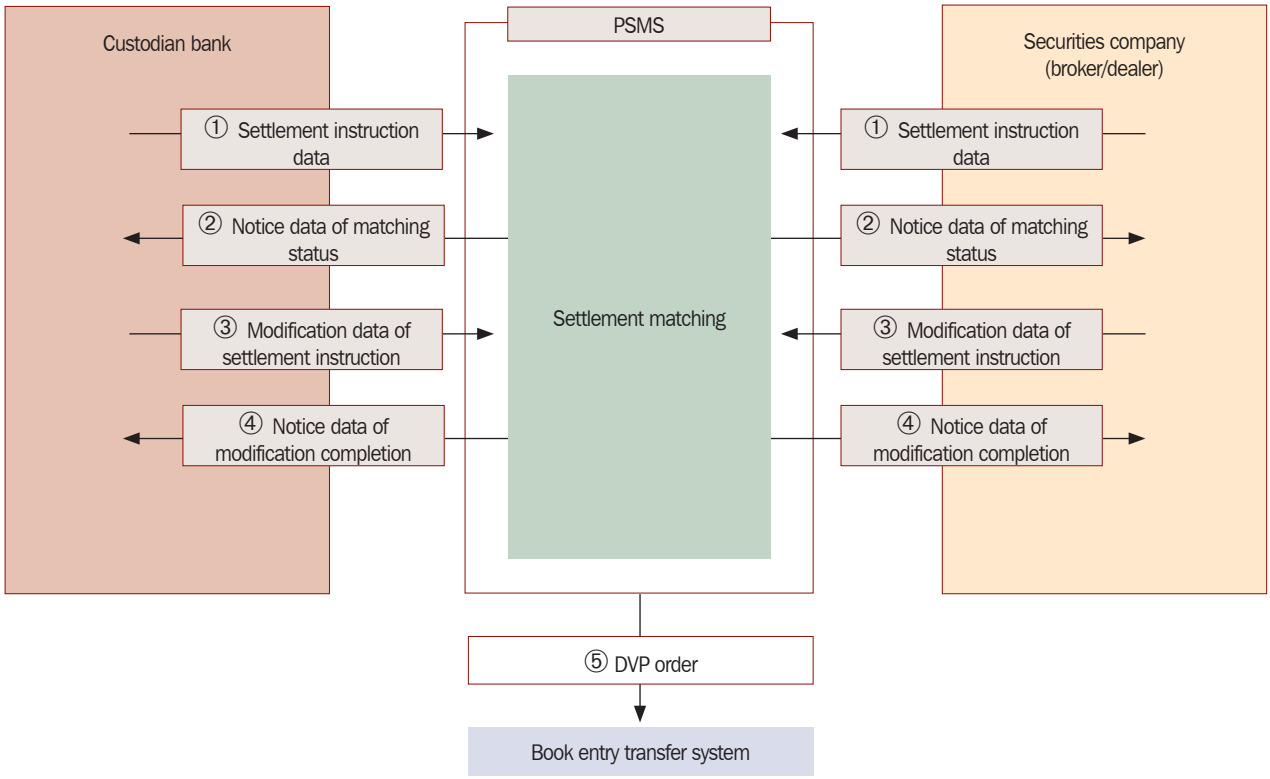
1. **Transmission of Settlement Instruction Data or Notice Data of Settlement Matching Status (Figure A2.2 ① and ②).** When Settlement Instruction Data (MT540 to 543) are received from settlement agents, such as banks and securities companies who perform custody operations (Figure A2.2 ①), PSMS searches for the data to be matched in accordance with the matching logic. When the data to be matched are specified, the matching procedure takes place and Notice Data of Settlement Matching Status (MT548) are transmitted to both the deliverer and receiver in real-time with the following corresponding status: "Unmatched" when there is one or more unmatched items; "Matched (settlement not executable)" when all items are matched but with Release Flag, which carries the information whether the settlement is executable or not, on either deliverer or receiver side stays "Release Not Executable"; or "Matched (settlement executable on settlement date)" when all items are matched and Release Flags on both sides stay "Release Executable" (Figure A2.2 ②).
2. **Transmission of Settlement Instruction Modification Data or Notice Data of Settlement Instruction Modification Completion Data** (Figure A2.2 ③ and ④). When the Release Flag in the Settlement Instruction Data states "Release Not Executable," settlement agents resend the correction data (MT599) to change the Release Flag to "Release Executable" after checking the balance of securities or funds, which caused the delivery to be suspended, and making the delivery to be executable (Figure A2.2 ③). When the modified data are received, the PSMS rewrites the Release Flag of Settlement Instruction Data already recorded, and transmits the modification completion data (MT548 or 578) with the corrected status to both deliverer and receiver (Figure A2.2 ④).
   It should be noted that the modification data could be issued not only to change the Release Flag but to correct the settlement amount.
3. **Generation of Delivery-Versus-Payment Order** (Figure A2.2 ⑤). When the Settlement Instruction Data carrying "LINK/DVP" is matching, the PSMS immediately generates a DVP Order from the matched settlement instruction data of both deliverer and receiver and transmits the order to the Book-Entry Transfer System (Figure A2.2 ⑤).

IV. Network and Connection with Users

A. User Connection Format

The formats of connection to the PSMS by users can be in two ways. One is to connect the user's own system directly (Central Processing Unit Direct Connection) to the

Figure A2.2 Non-Residents' Transactions



DVP = delivery versus payment; PSMS = Pre-Settlement Matching System
Source: Japan Securities Depository Center, Inc.

PSMS and the other is to use a personal computer (PC) with a web browser as a terminal of the PSMS (Terminal Connection). The former can utilize either of two types of processing: online real-time processing and batch processing by file transfer. For online real-time processing and batch processing by file transfer, users can choose either to connect their own systems to the PSMS, or to have the systems of their computer service subcontractors connected to the PSMS. In the case of online real-time processing, dedicated lines are commonly used; for file transfer and terminal connection, Integrated Services Digital Network lines are used.

B. Terminal Functions

For users who have large volume of trades, direct online real-time connection of their systems to the PSMS is efficient in view of the possibility to further shorten the settlement cycle in the future. However, for users who do not have large volume of trades and wish to curtail the initial investment for system development, Terminal Connection to the PSMS is convenient. To utilize the services provided, users only need to prepare a PC with certain specifications and a web browser, and log on to the web server of the PSMS. The transmission or receipt of data explained above is possible by means of this terminal function. For data transmission, users may choose either key-input through the form on-browser or comma separated value file transfer.

Republic of Korea (KOR)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

The Korean bond market is comprised of the over-the-counter (OTC) market and exchange market operated by the Korea Exchange (KRX). In Korea, four types of bonds are traded on the markets such as Korean government bond (KGB), corporate bond, commercial paper (CP), and Certificate of Deposit (CD). About 70% of bond trades are performed on the OTC market, whereas other bonds are traded on the exchange market. For Trade matching, KRX executes matching for trade on the KRX market while Korean Securities Depository (KSD) execute it for other Trades on the OTC market. KRX is also designated to provide clearing service on the exchange market. For settlement, KSD is in charge of securities settlement for all kinds of bonds while the Bank of Korea (BOK) is in charge of cash settlement as a central bank. The bond market infrastructure in Korea is shown in Part 3, Figure E.1.

1.2 Description of Related Organizations

Financial Supervisory Service (FSS)

The FSS acts as the Financial Services Commission's (FSC) executive arm. The main objectives of the FSS are to provide supervision and conduct examination and investigation of financial institutions to ensure sound and fair trading practice in the financial markets and to protect investors.

Korea Financial Investment Association (KOFIA)

KOFIA was launched on 4 February 2009 through the merger of three associations representing the securities, asset management and futures industry, as set forth by the *Financial Investment Services and Capital Markets Act* (FISCMA), which took effect the same day. To provide transparent and accurate information to participants, KOFIA established FreeBond and manages the OTC market.

Korea Exchange (KRX)

The former three exchanges in Korea, i.e., the Korea Stock Exchange (KSE), Korea Futures Exchange (KOFEX), and the Korean Securities Dealers Automated Quotations (KOSDAQ) Market, have merged into the KRX effective 27 January 2005.

KRX maintains a fair and orderly market for trading securities; it also regulates and supervises its member firms via market operational rules set by the KRX.

Korea Securities Depository (KSD)
KSD was established in 1974 to act as the central depository of the Korea market. KSD is the single central securities depository (CSD) in Korea. In 1994, KSD became a non-profit making organization by increasing its shareholders. The shareholders of the KSD are various market participants, KRX, banks, and other banking corporations.

The name of KSD's network is SAFE+. The types of lines are leased line (front end processor [FEP]) and the Internet.

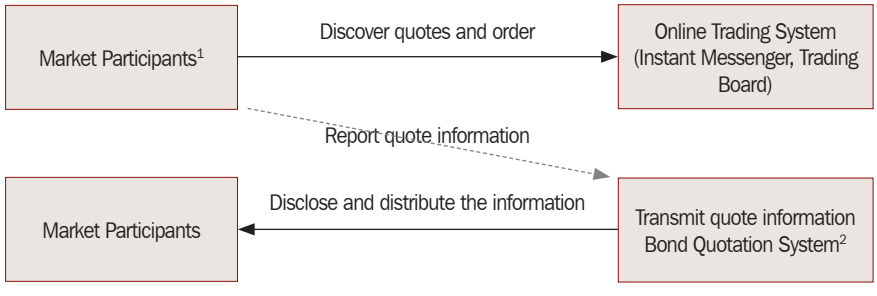
The Bank of Korea (BOK)
BOK was created on 12 June 1950 under the *Bank of Korea Act*. BOK conducts the typical functions of a central bank such as issuance currencies, formulation and the implementation of monetary and credit policy, as bankers' bank, and as the government bank.

1.3 Trading

1.3.1 Over-the-Counter Market

In the Korean OTC market, the seller and buyer trade bonds mostly via a private messenger and partly through the FreeBond. FreeBond, which is run by KOFIA, enables financial investment firms and major market practitioners to search bid or ask prices for trading and intermediation in the OTC bond market. FreeBond also supports trading negotiation with trading counterparties. It consists of two components: Trading-Board (T-Board) and messenger. T-Board has many functions, such as searching bid prices, ordering, negotiation, confirming trade, providing real-time information on bid prices, and analyses. Messenger actualizes one versus N-chatting, storing and using chatting frame layout, and chatting room service. The operation of FreeBond is illustrated as follows.

Figure 5.1 Operation of FreeBond

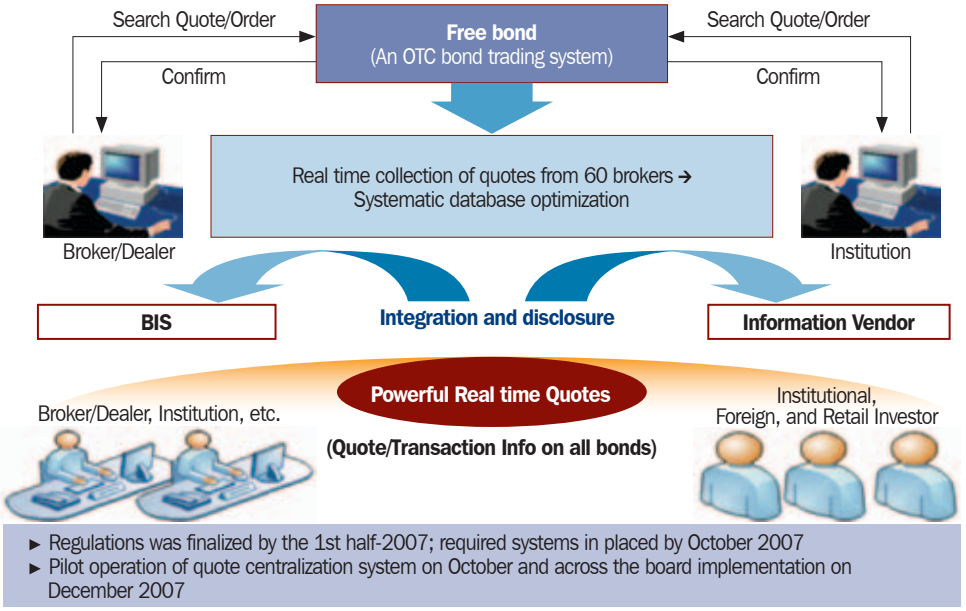


1. Market participants discover bid or ask price on FreeBond and execute orders.
2. Quote information is transmitted to the Bond Quotation System (BQS).
Source: The Korea Financial Investment Association.

KOFIA is planning and working on adding matching service and link Freebond to the settlement system (or institution) when related laws and regulations in the country changes.

The centralization and disclosure of OTC quotations is illustrated as follows.

Figure 5.2 Centralization and Disclosure of Over-the-Counter Quotations



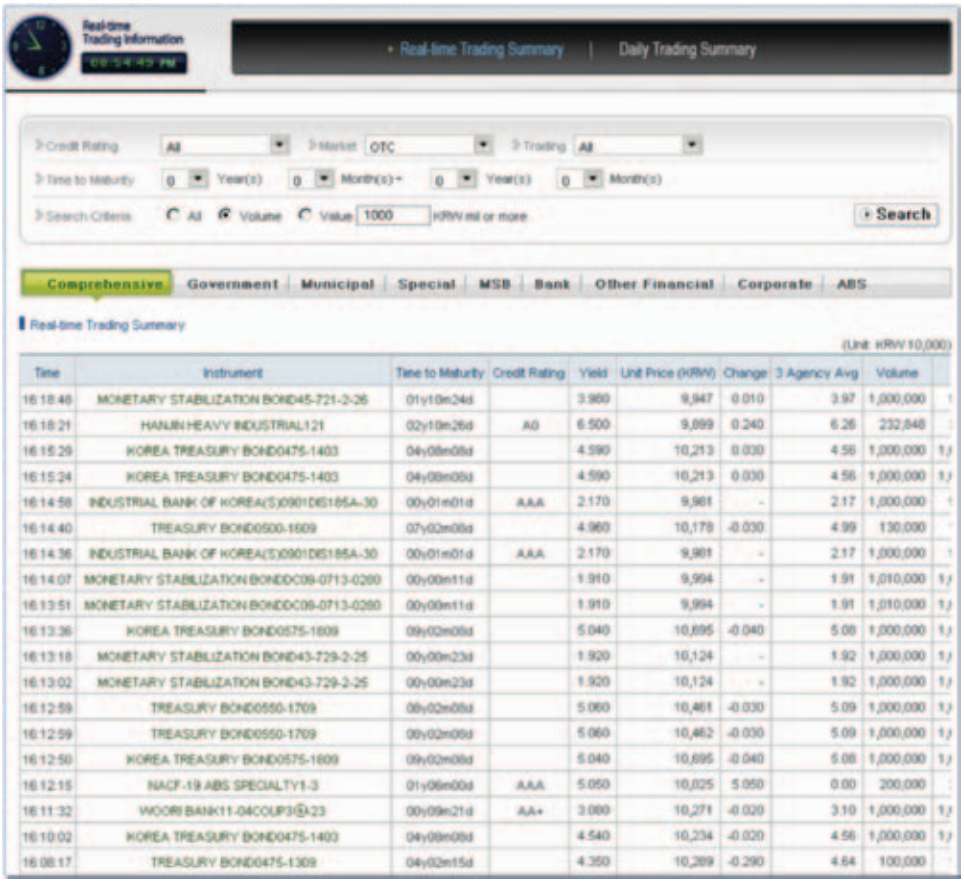
BIS = Bond Information Service
Source: The Korea Financial Investment Association.

If the client is a foreign investor, the seller side and/or the buyer side of securities companies transfer order information to the FSS via the Foreign Investment Management System (FIMS). After acceptance of order information, FSS judges acceptance or rejection of the order. FSS determines whether to accept or reject the order. If holding is enough, the FSS transfers order information to the seller side and/or the buyer side of securities companies and the KRX.

A screen image of the Bond-Trade Report and Information Service (B-TRiS) is shown in Figure 5.3.

A financial investment company engaging in bond trading shall, when trading or brokering bonds with investors in the OTC market, report to KOFIA the details related to such trading within 15 minutes from the point of settlement of the sales agreement, using B-TRiS to enhance transparency on the OTC bond market. After reporting, KOFIA discloses this information on its website.

Figure 5.3 Screen Image of the Bond-Trade Report and Information Service



Source: The Korea Financial Investment Association

1.3.2 Exchange Market

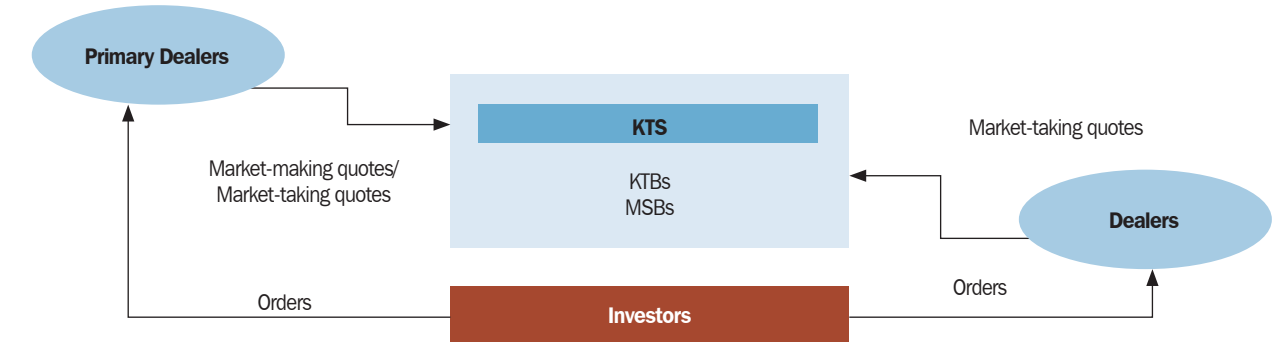
The KRX supplies the KRX Electronic Trading System for Government Bonds (KTS) browser system to market participants. Participants are directly connected with the KTS using the KTS browser without any additional cost, provided that Internet access is available. There are currently 65 market participants. There are currently 65 market participants, 40 of which are regular members and 25 are bond members. By function, primary dealers are 20 and secondary dealers are 45 as of January 2011.

On the KTS, securities such as the Korea Treasury bonds (KTB), Monetary Stabilization Bonds (MSB) issued by the BOK, and Deposit Insurance Fund Bonds (DIFB) issued by the Korea Deposit Insurance Corporation are traded. Trading hours are from 9:00 a.m. to 3:00 p.m. Trading lot is KRW1 billion.

Since the exchange market (KRX) is an order-driven market, bonds are traded through a competitive bidding system. The bid-and-ask orders placed by eligible participants are automatically executed by a centrally matching system. If the client is a foreign investor, the seller side and/or the buyer side of securities companies transfer the order information, as well as trading on the OTC market, to the FSS.

The KTS market structure is illustrated as follows.

Figure 5.4 Market Structure of the KRX Electronic Trading System for Government Bonds



KTBs = Korea Treasury bonds; KTS = KRX Electronic Trading System for Government Bonds; MSBs = Monetary Stabilization Bonds
Source: Korea Exchange.

1.4 Central Counterparty Clearing

1.4.1 Central Counterparty Clearing for the Over-the-Counter Market

There is no central counterparty clearing (CCP) on the OTC market.

1.4.2 Central Counterparty Clearing for the Exchange Market

KRX owns and operates the netting system for the trades on the exchange market as a CCP. Through KRX debt assumption without responsibilities, multilateral trading in Korea's market shifts to a bilateral trading relationship between KRX and its members. This guarantees the legal validity of multilateral netting. Netting is a process that confirms the securities and charges to be delivered by members to the KRX (CCP) on the settlement date. For securities, the quantity of securities to be delivered is calculated from the balance (net) between the selling and buying quantities per issue and members. For charges, the net single position is calculated by finding the net between buying and selling charges per member. In order for settlements to be accomplished according to the calculated settlement positions, the KRX gives settlement orders to member firms and the KSD. Bond trades in the exchange market are cleared by the KRX on the multilateral netting basis. In this process, the KRX acts as the central counterparty.

1.5 Bond Settlement

1.5.1 Bond Settlement Traded at the Over-the-Counter Market

All bonds, including Korean government bonds, are deposited in registered form in the KSD. Participants of the KSD are 257 institutions (63 broker/dealer, 51 banks, 81 asset management, 23 insurance companies, 4 pension funds, and 33 others) as of the end of 2010. KSD conducts simultaneous security and cash settlement on a trade-by-trade base (Delivery-versus-Payment [DVP] Model1).

1.5.2 Bond Settlement Traded at the Exchange Market

KSD also provides DVP settlement for bond trades via the KRX market. KSD has launched a new bond settlement system since November 2011. The new system introduces DVP Model 1 after netting, whereas the previous system adopted DVP Model 3. The new system electrically connects KTS and the New Bank of Korea Financial Wire Network System (BOK-Wire+).

1.6 Cash Settlement

BOK owns and operates BOK-Wire+ for cash settlement system. BOK-Wire, introduced in December 1994, was a large-value payment system owned and operated by the BOK. Through this system, the BOK provided funds-transfer service via participants' current accounts with the BOK. In November 1999, the BOK also began providing a DVP service, and in December 2004 it connected with the Continuous Linked Settlement (CLS) system to enable payment-versus-payment (PVP) service for foreign exchange settlement involving Korean won. In its early days, BOK-Wire processed fund transfers based solely on its real-time gross settlement (RTGS) mechanism. As the BOK-Wire settlement volume surged, however, liquidity burdens on participants increased. In May 2005, the BOK, therefore, launched a 4-year project to develop a new system (BOK-Wire+), which would use not only the pre-existing RTGS mechanism but a hybrid settlement mechanism[9] as well. BOK-Wire+ has operated stably since its launch in April 2009. It replaced BOK-Wire, the pure RTGS system which had been in operation since 1994. The key feature of BOK-Wire+ is the introduction of a hybrid system in addition to the previous pure RTGS system. The BOK-Wire+ hybrid system provides bilateral and multilateral offsetting settlements for liquidity savings. BOK also provides intraday overdraft with KRX for settlement of government bond transactions.

BOK-Wire+ settlement procedures are sub-classified into those using the RTGS system and those using the hybrid system with its bilateral and multilateral offsetting features added to the RTGS system. Participants hold two types of accounts with the BOK—current accounts and deposit accounts for settlement. The former are used for transactions carried out through the RTGS system and the latter for those through the hybrid system.

Funds transfers involving BOK loans, government and public bond transactions, CLS and Retail Payment System (RPS) net settlement are handled through the RTGS system, while those related to general funds transfers, call transaction settlements, and DVP settlements are processed through the hybrid system.

Online operating hours of BOK-Wire+ are from 9:00 a.m. to 5:30 p.m. from Monday to Friday. The BOK may extend these hours temporarily if it deems necessary due to error in BOK-Wire+ system, delays or concentrations of fund settlement, or any other unavoidable reasons.

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9 A hybrid settlement system is a payment system which combines characteristics of RTGS system and netting system by adding bilateral and multilateral offsetting features to the RTGS system.

2. Typical Business Flows

2.1 Delivery-versus-Payment Flow for the Over-the-Counter Market

Please refer to Part 3, Figure E.2 on bond transaction flow for domestic trades on the DVP OTC market.

2.2 Delivery-versus-Payment Flow for the Exchange Market

Please refer to Part 3, Figure E.3 on bond transaction flow for domestic trades on the DVP exchange market.

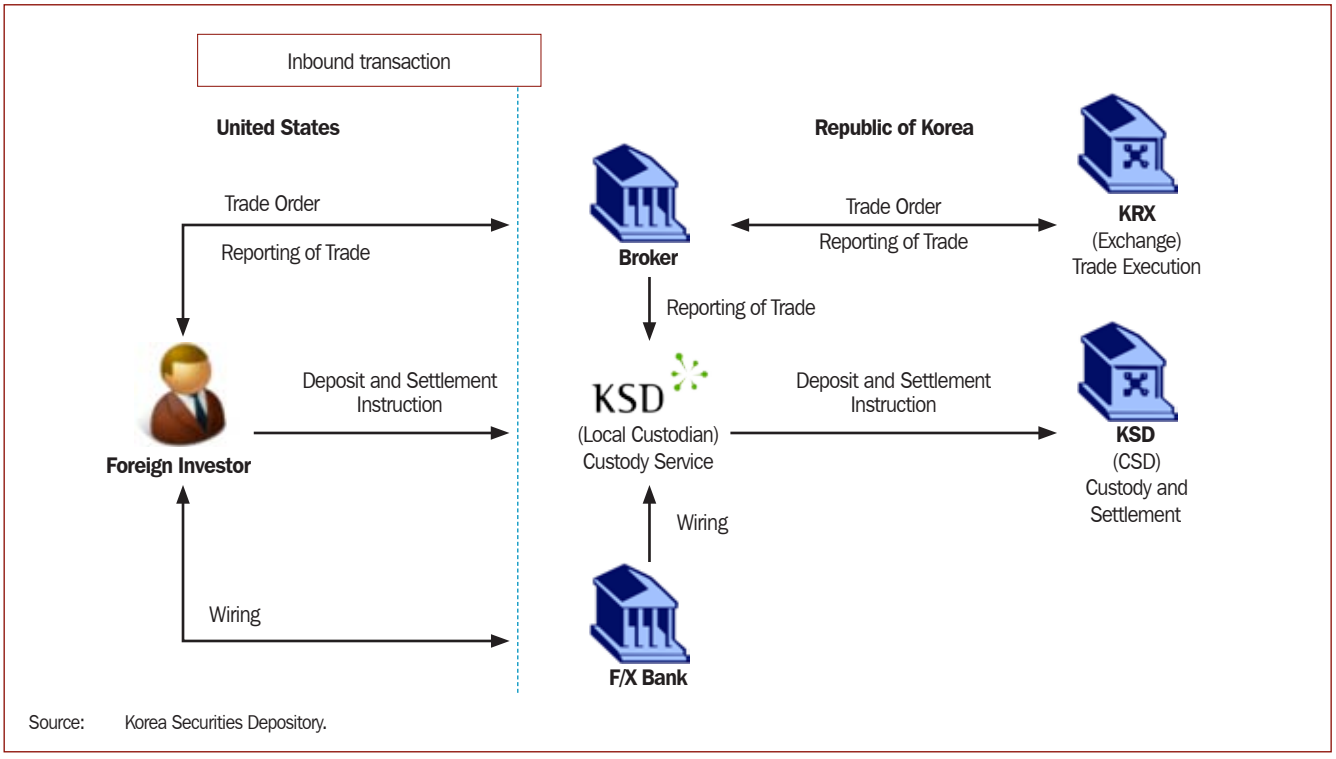
2.3 Delivery-versus-Payment Flow for Cross-Border Bond Transactions

Please refer to Part 3, Figure E.4 on bond Transaction flow for foreign investors on the DVP OTC market.

2.4 Other Specific Examples of Cross-Border Bond Transactions

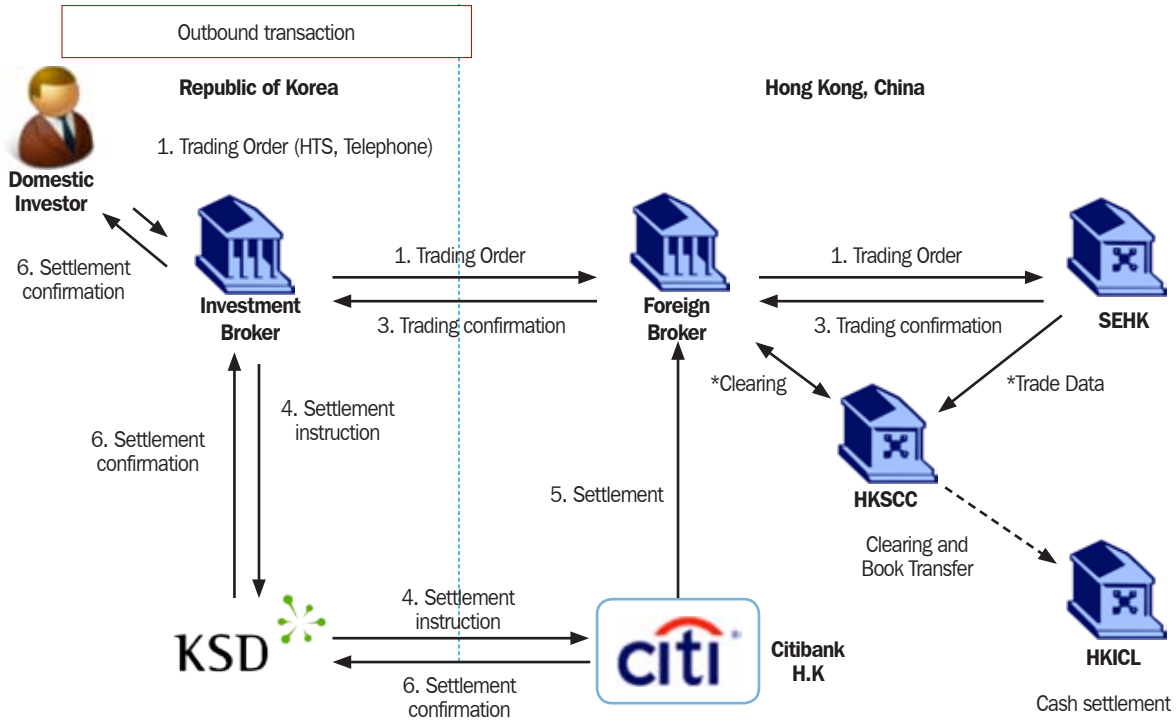
Typical examples of cross border transaction flow include inbound transaction by an investor from the United States through a local custodian (KSD) (Figure 5.5) and outbound transaction flow for the Hong Kong market through a global custodian (Figure 5.6), Citibank HK, are illustrated as follows.

Figure 5.5 Sample of Inbound Transactions in the Korea Bond Market



Source: Korea Securities Depository.

Figure 5.6 Sample of Outbound Transactions in the Korea Bond Market

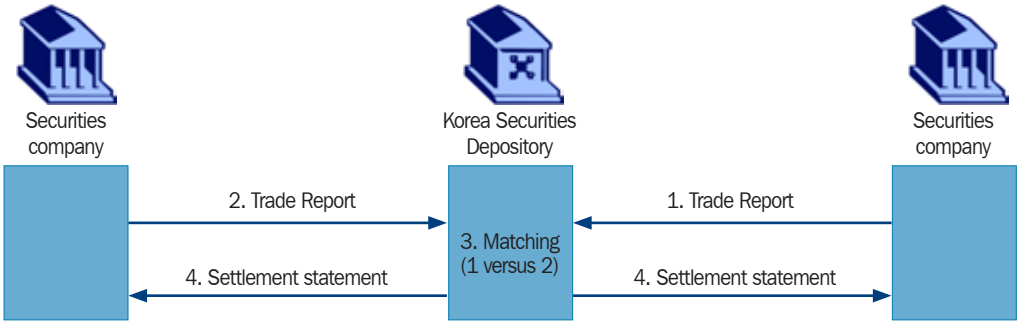


HK = Hong Kong; HKICL = Hong Kong Interbank Clearing Limited; HKSCC = Hong Kong Securities Clearing Company; HTS = Home Trading System; KRX = Korea Exchange; KSD = Korea Securities Depository; SEHK = Stock Exchange of Hong Kong
Source: Korea Securities Depository.

3. Matching

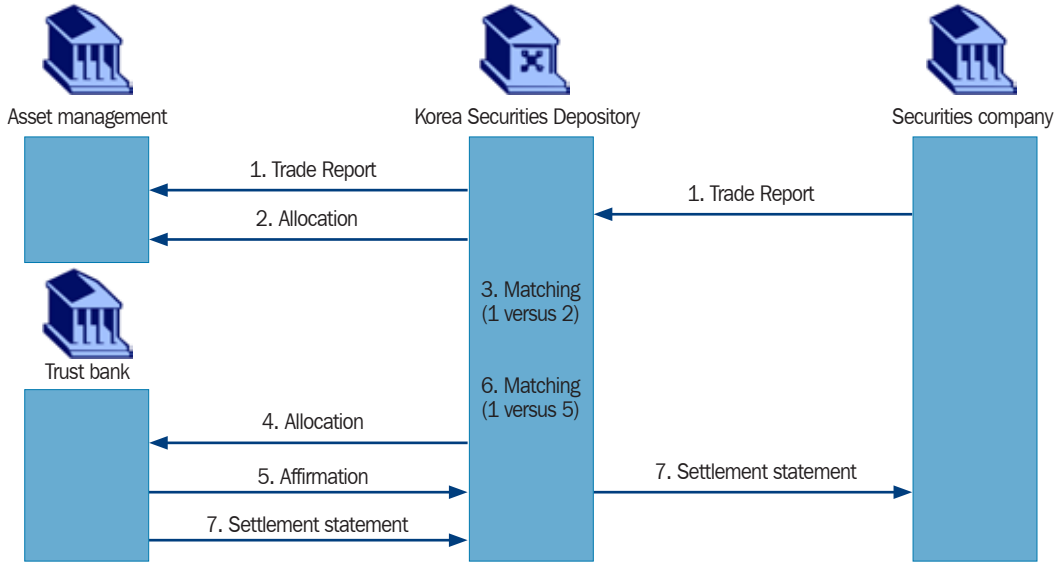
Both central and local matching facilities are provided to fit each individual case. Central matching is widely used for almost all trades, except for trade funds including members versus its clients who adopt local matching. The seller and buyer send trade data to the KSD and the KSD collates trade data from the seller and buyer. KSD then sends matching status advise to the seller and buyer. Central matching for KRX in the OTC market is illustrated in Figure 5.7 below.

Figure 5.7 Central Matching for Korea Exchange on the Over-the-Counter Market



Source: Korea Securities Depository

Figure 5.8 Local Matching on Over-the-Counter Market



Source: Korea Securities Depository.

4. Settlement Cycle

For the OTC market, the settlement cycle is T+1 – T+30. Conventionally, T+1 is adopted to align with exchange trade. The settlement cycle on the OTC market is based on a bilateral contract between counterparties. The settlement cycle of cross-border trades depends on the contract. Usually the settlement cycle of cross-border transaction through Euroclear or Clearstream is T+1 – T+3.

For the exchange market, the settlement cycle is T+1. In case of cross-border trades, the settlement cycle of inbound transaction is T+1. On the other hand, settlement cycle of outbound transaction follows the settlement cycle of the designated country for investment.

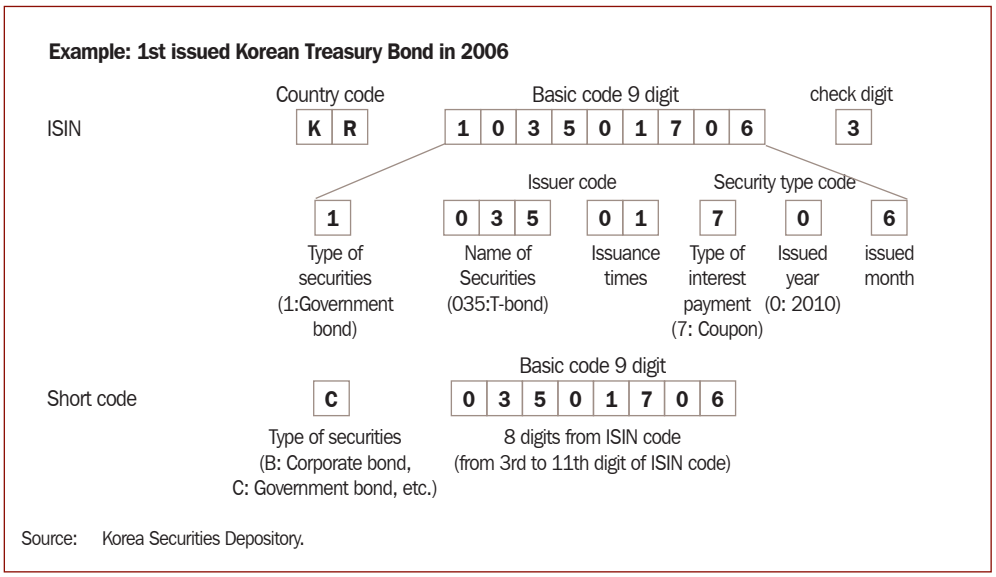
5. Numbering and Coding

5.1 Numbering and Coding for the Over-the-Counter Market and Exchange Market

5.1.1 Securities Numbering

The KRX is authorized by the International Standardization Organization (ISO) for securities numbering in Korea. The International Securities Identification Number (ISIN) is adopted as the numbering standard by the KRX. In the domestic market, short code is also used to identify bond name, which is composed of nine digits. The first digit is alphabetic code, which denotes type of security. An example of the first issued Korean Treasury bond in 2006 is shown as follows.

Figure 5.9 Sample of First Issued Korean Treasury Bond in 2006

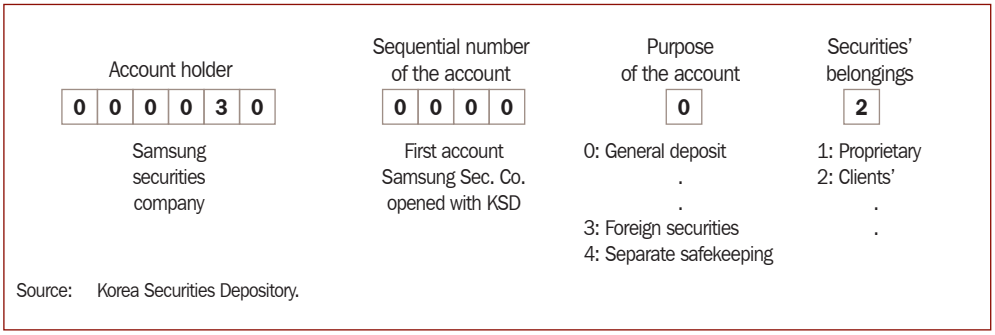


Source: Korea Securities Depository.

5.1.2 Financial Institution Identification

Each institution such as KSD, the KRX and BOK has proprietary code for each financial entity. KSD uses an account number as an identification number. All of KSD's participants have one or more account number. The account number has 12 digits. The first six digits mean account holder, the next four digits in the middle mean the purpose of the account, and last digit means securities belongings (proprietary or client's). KSD's code structure is illustrated as follows.

Figure 5.10 Korea Securities Depository Code Structure



Source: Korea Securities Depository.

In case of conversion between the Business Identifier Code (BIC) and the local code, mapping the BIC onto local code is executed and vice versa.

5.1.3 Securities Account

A securities account number is used as a financial institution identification code in the KSD.

5.1.4 Cash Account

Proprietary account numbers by the BOK or commercial banks is used for cash accounts. If necessary, mapping the International Bank Account Number (IBAN) into the proprietary code is executed and vice a versa

4.1.5 Character Code and Language

Unicode and UTF-8 are used for character code while Korean is used for bond settlement Infrastructure.

6. Medium- to Long-Term Strategies

KSD was established a new bond settlement system in November 2011 to build a cost-effective Securities Settlement System (SSS) and enhance risk management in the system.

6.1 Background

The domestic bond market has seen a sharp rise in transaction and settlement volumes as a result of heightened market activity since 2006. However, the bond settlement system lacks sufficient improvement to respond to increased transaction and settlement volumes. In particular, chronic settlement delays occur due to lack of compatibility between settlement means of the exchange market and the OTC market (the completion of settlement takes place around 6:00 p.m.). As such, enhancement of the SSS is being pursued to enhance its stability and sharpen its competitive edge.

To resolve the problem of settlement delays in the BOK-Wire+ caused by delays and gridlock in the SSS, the BOK drew up the "Strategy for Upgrading the Securities Settlement System" in November 2009, jointly with the KRX and the KSD. The main elements of this strategy include improvement of the DVP settlement method for greater efficiency in securities settlement, provision by the BOK of intraday liquidity for the settlement of bond transactions, changing of the fund settlement bank for the exchange-traded stock markets, and the introduction of a Continuous Net Settlement (CNS) system. In 2009, KSD, KRX, and BOK formed the Working Group for Securities Settlement System Improvement and concluded the "Agreement on the Securities Settlement System Improvement." The target date for opening business is in November 2011.

6.2 Highlights of Strategy for Upgrading the Securities Settlement System

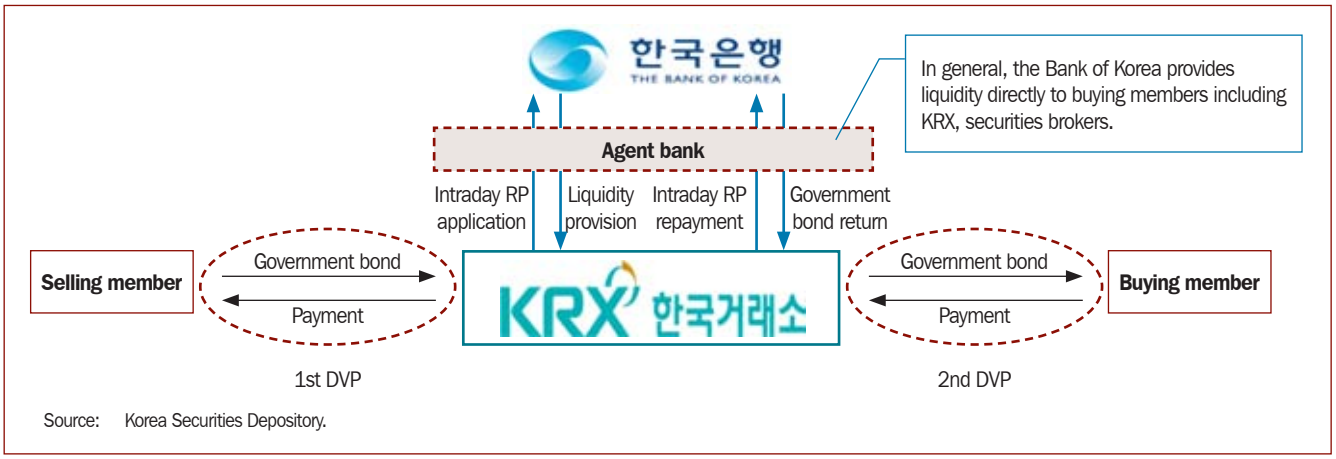
1. Improvement of DVP Method
   - Settlement of exchange-traded government bonds: Net settlement by issue for both bonds and funds.
   - Settlement of exchange-traded Repurchase Agreements (RPs): Gross settlement per individual transaction for both securities and funds.
   - Settlement of stock transactions by institutional investors: Net settlement per transaction for securities and per member for funds.
   - Starting time for exchange-traded government bond and stock settlement made progressively earlier.
2. Provision of Intraday Liquidity for Settlement of Government and Other Bonds
   - BOK to provide intraday liquidity to financial investment companies and the KRX for settlement of exchange-traded or OTC bond transactions, including government bonds.
3. Introduction of CNS System in Exchange-traded Stock Markets
   - Securities submitted by settlement deadline (4:00 p.m.) delivered immediately to destined members, and those submitted after deadline netted and settled together with securities settled the following business day.

4. Change of Fund Settlement Bank for Exchange-traded Stock Markets
   - BOK to provide fund settlement services for exchange-traded stock markets from the start of the new system.

6.3 Improvement Measures

Improvement measures of government bond settlement are illustrated in Figures 5.11 and 5.12. These include changing the settlement beginning time and the DVP model, as well as the introduction of DVP model 1 after netting.

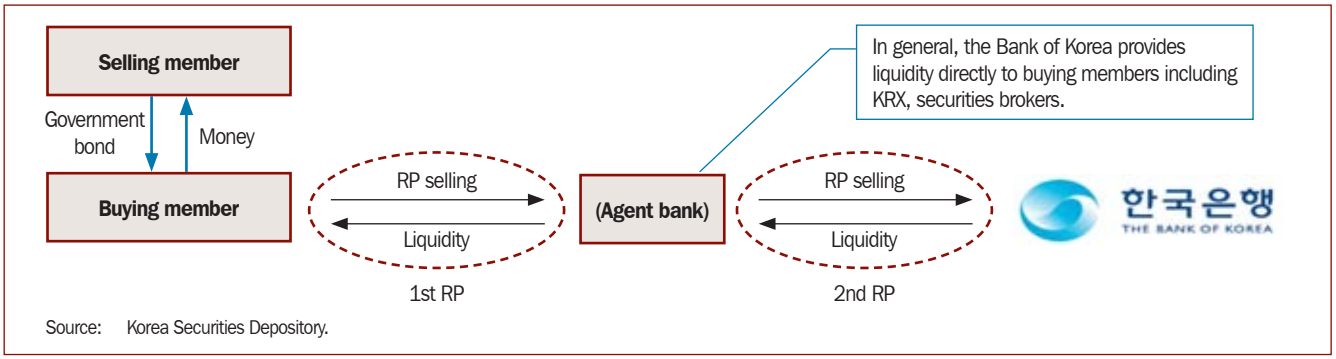
Figure 5.11 Basic Structure of Exchange Settlement of Korean Government Bonds



Source: Korea Securities Depository.

With purchased government bonds under settlement of the BOK as collateral, establishing the intraday RP system to provide liquidity.

Figure 5.12 Basic Structure of Intraday RP System



Source: Korea Securities Depository.

The expected effects of these improvement measures are as follows:

- Enhancement of efficiency in securities settlement
- Enhancement of safety of securities settlement
- Enhancement of convenience of market participants
- Securing global compatibility

Malaysia (MAL)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

The Malaysian bond market is comprised of the over-the-counter (OTC) market and the exchange market. Unlisted bonds are largely traded on the OTC market while listed bonds are traded through Bursa Malaysia (exchange market). More than 95% of Malaysian bonds are traded on the OTC market. Trade data are entered into the electronic trading platform (ETP), which was launched by Bursa Malaysia in March 2008.

The Real-time Electronic Transfer of Funds and Securities (RENTAS) is the central securities depository (CSD) and real-time gross settlement (RTGS) system for government bond trades in Malaysia. The RENTAS system is comprised of the Scripless Securities Depository System (SSDS), which allows book-entry settlement and recording of holdings of scripless debt securities; and the interbank funds transfer system (IFTS), which deals with large-value fund transfers. It is a delivery-versus-payment (DVP) Model 1 system. Bank Negara Malaysia (BNM) owns and operates RENTAS.

Please refer to Part 3, Figure F.1 for the bond market infrastructure diagram.

1.2 Description of Related Organizations

Bursa Malaysia

Bursa Malaysia is an exchange holding company approved under Sec. 15 of the *Capital Markets and Services Act 2007*. It operates a fully integrated exchange, offering a complete range of exchange-related services including trading, clearing, settlement and depository services.

Bursa Malaysia Securities Clearing Sdn Bhd (BMSC)

BMSC is a wholly-owned subsidiary of Bursa Malaysia with a paid-up capital of MYR300 million and provides clearing and settlement facilities for contracts done between clearing participants. BMSC was incorporated on 12 November 1983 and commenced clearing house operations in March 1984. The BMSC is governed by the BMSC Rules which came into force on 1 January 1997. On 11 November 2002,

BMSC completed the acquisition of Bursa Malaysia Derivatives Clearing Berhad, thus, making it a wholly-owned subsidiary of BMSC.

MyClear

MyClear is an operator of key market infrastructure for the securities market and provides securities and payment services via RENTAS (CSD and RTGS) and the Fully Automated System for Issuing/Tendering (FAST), the issuing system for unlisted debt securities. MyClear was incorporated in October 2008 and commenced operation on 2 January 2009. It was established as a wholly-owned subsidiary of BNM as a separate overseer and operator of the systematically important payment systems. Facilitating cross-border securities payments and settlement is also part of the role of MyClear.

Bursa Malaysia Depository (BMD)

BMD is a subsidiary of Bursa Malaysia and was established in 1990. It is incorporated under the *Companies Act, 1965* and authorized to perform the role of a central depository by the *Securities Industry (Central Depositories) Act, 1991* (SICDA). SICDA provides the legal framework and safeguards for users and participants in the central depository system (CDS).

Bank Negara Malaysia (BNM)

BNM is the central bank of Malaysia. Today, the BNM focuses on the three pillars of the central banking, such as monetary stability, financial stability, and the payment system. In addition, BNM is responsible for the issuance, registration, and settlement and redemption of the government bonds through the in-house automated trading and settlement system. BNM introduced a payment system called the RENTAS system.

1.3 Trading

1.3.1 Over-the-Counter Trading

The Malaysian bond market consists of listed and unlisted bonds. Unlisted bonds are largely traded as the OTC trade. Most trading takes place on the OTC market, where quotes are typically obtained directly from money brokers and dealers over the phone. Financial institutions would either have to be registered or licensed by the Securities Commission of Malaysia (SC) to trade in bonds for their own or their clients' accounts. An agreement concluded over the telephone is then followed up with a confirmation order in writing. An investor can place an order with a dealer at his desired price and amount. However, trade will only be concluded when the dealer can find a corresponding seller in the OTC market.

Financial institutions maintaining their own bond inventories usually provide their market bid or offer prices to their clients. In addition, principal dealers (PDs) are obliged to provide 2-way quotes for benchmark government securities. Information on Government securities and bond indices are also available on the tickers on Bloomberg and Reuters. All trading on the OTC market are reported on the ETP, where the seller of the securities keys in the deal and buyers confirm within the stipulated 10 minutes' cut-off time from trade execution. Normal business hours for a securities trade are as per standard settlement or value spot, i.e., two business days (T+2) from 9:00 a.m. to 4:30 p.m. from Monday to Friday, excluding holidays. Some custodian prefer T+3.

Bursa Malaysia introduced the ETP on 10 March 2008 for the Malaysian bond market in line with the National Bond Market Committee's mandate to develop a single electronic trade reporting and trading platform for the domestic bond market. The ETP is operated by Bursa Malaysia Sdn Bhd, a wholly-owned subsidiary of Bursa Malaysia. ETP was introduced to boost transparency and liquidity, as well as increase efficiency in bond trading. The launch of the ETP is in line with the ongoing commitment to further improve market accessibility and increase trading efficiencies via infrastructure enhancement initiatives. The decision to develop the ETP was made in February 2004 by the National Bond Market Committee, which includes the Ministry of Finance (MoF), SC and BNM.

ETP allows dealers to match bids with offers, negotiate deals, and access historical data through a common computerized network. ETP offers investors real-time price quotation and facilitates the trading and reporting of all secondary market activities.

The key business components that contribute to the business of ETP are:

- Central order book for matching, trade reporting and negotiation
- A comprehensive dissemination system for price per yield and trade information dissemination
- Data storage for market history data referential maintenance for exchange administrator
- A real-time market surveillance system.

The ETP system interfaces with other systems such as the FAST and other information provider (i.e., Bloomberg and Reuters). 100% of volume is done OTC via voice brokers and electronic message. But, for the time being, there is almost no transaction process by ETP.

1.3.2 Exchange Trade

Bonds listed on Bursa Malaysia may be purchased through a dealer who is a member of the exchange, such as investment banks or through remisiers. To trade in listed bonds, investors are required to open a depository account operated by BMD. These accounts are maintained by banks that are members of the exchange, acting as authorized depository agents. The depository account works on the principle of a book-entry system or electronic clearing and settlement, and represents ownership and movement of the listed bonds. Institutional investors may open depository accounts directly with the BMD. Investors need to provide their depository account numbers when buying or selling listed bonds on the exchange. Listed bonds are normally traded in board lots of 1,000 units. Information on prices of listed bonds is readily available on the ETP.

1.4 Central Counterparty Clearing

1.4.1 Central Counterparty Clearing for the Over-the-Counter Market

There are no CCPs in the Malaysian OTC market.

1.4.2 Central Counterparty Clearing for the Exchange Market

BMSC is the clearing house for bond securities traded on the Bursa Malaysia stock exchange. BMSC provides the Bursa Clearing and Settlement System for participants

on the exchange market. The Bursa Clearing and Settlement System electronically connects with the Bursa Trade System and Central Depository System.

1.5 Bond Settlement

1.5.1 Bond Settlement Traded on the Malaysian Over-the-Counter Market

To subscribe to or trade in debt securities, an investor must open an account with an authorized depository institution (ADI). ADIs are licensed financial institutions that are members of RENTAS and are allowed by BNM to hold SSDS securities on behalf of customers that are not members of the SSDS. For members of the SSDS, BNM is the authorized depository, crediting bondholders with scripless bonds for trading and transfers according to the *Code of Conduct and Market Practices for Scripless Trading*, and recording the holdings and transactions of each SSDS member institution. ADIs offer protection to investors with regard to payment of interest and redemption proceeds. They ensure secrecy of accounts, issue statutory acknowledgement receipts and monthly statements detailing account holdings and transfers, and carry out the various responsibilities of depository institutions to their customers. Dealers that act as ADIs maintain two accounts with the SSDS: one for their own holdings, and another for all the securities they hold in custody, through which non-SSDS members' transactions are cleared and settled. ADIs are required to maintain a separate account for each customer.

All securities trades are generally settled based on a delivery-versus-payment (DVP) basis. For all government securities and scripless corporate debt securities, ownership and transfers are reflected as book entries in the ADIs' custody accounts with BNM in RENTAS. For non-RENTAS members, such as institutional investors and other financial institutions, scripless securities can be transacted via their ADIs. Cash payments of coupons, as well as redemption proceeds, will be forwarded to investors via their respective ADIs.

The settlement of the primary and secondary market transactions in government securities and unlisted corporate debt securities take place through the SSDS, which is part of RENTAS. RENTAS, established by BNM in 1999, comprises the IFTS, which deals with large-value fund transfers, and the SSDS, which allows the book-entry settlement and recording of holdings of scripless debt securities. A sale or purchase of securities between two parties involves a book-entry and intraday settlement of funds in the cash settlement account maintained with BNM. RENTAS, which has straight-through-processing (STP) capability, will process, transfer and settle interbank funds and scripless transactions simultaneously in real time. It is a DVP Model 1 system, i.e., securities and funds settled gross throughout the day.

RENTAS contributes to the reduction of settlement risk in scripless securities transactions by providing a mechanism for DVP. This mechanism would enable transfer instructions for both scripless securities and funds to be effected on a trade-by-trade basis, with final (unconditional) transfer of the securities from the seller to the buyer (delivery) occurring at the same time as the final transfer of the funds from the buyer to the seller (payment). RENTAS utilizes the Corporate Information Superhighway (COINS), which is a nationwide, broadband network which supports multiprotocol and multimedia applications provided by Syarikat

Telekom Malaysia Berhad as the communication network to link up participating financial institutions.

1.5.2 Bond Settlement Traded on the Exchange Market

BMD operates the Central Depository Sytem (CDS) which has created a scripless trading platform for trading bonds. CDS facilitates electronic securities transfer and trade settlement, and uses the book-entry form of recording ownership and movement of securities. BMD has been offering omnibus accounts since 2005.

1.6 Cash Settlement

The RENTAS IFTS is an RTGS system for the transfer and settlement of high-value ringgit-denominated interbank funds and scripless securities transactions. RENTAS IFTS enables payment instructions between participants of the system to be processed and settled individually and continuously throughout the working day. All settled transactions are considered as final and irrevocable. Thus, the receiver can use the funds immediately without being exposed to the risk of the funds not being settled. This is in contrast to the former system, Sistem Pemindahan Elektronik Dana dan Sekuriti (SPEEDS), which was a deferred net settlement system, where payments were processed throughout the working day, but actual entries across the books of BNM were only effected at the end of the day. RENTAS IFTS, being an RTGS system, can substantially reduce or eliminate settlement exposures for participants of the system. Besides reducing the settlement risk for interbank funds transfers, RENTAS IFTS can help reduce the risks in exchange for value settlement systems such as those for securities settlements. The system has the capacity to handle higher volume of transactions compared to the SPEEDS System, and incorporates better security features through the use of smart cards for authentication and transmission. Provision had also been made for international linkages to facilitate real-time DVP and real-time payment versus payment (PVP) should this need arise in the future.

Intraday credit is permitted in the market, and may depend on intermediaries' assessment of client standing. Overdraft is also available, for technical reasons (e.g., time-zone differences) for up to 2 business days; and requires advised credit line (or prefunding arrangement).

2. Typical Business Flows

2.1 Delivery-versus-Payment Flow in the Malaysian Over-the-Counter Market

Please refer to Part 3, Figure F.2 on the bond transaction flow for domestic trades in the OTC market (DVP).

2.2 DVP flow for Cross-Border Bond Transactions

Please refer to Part 3, Figure F.3 on the bond transaction flow for foreign investors in the OTC market (DVP).

Scripless securities, including Malaysian government securities and selected debt securities, can also be settled internationally via major global custodian banks and international central securities depositories (ICSDs), such as Euroclear and Clearstream. Both these ICSDs currently appoint selected ADIs, which are clearing

members of RENTAS, as their clearing agents in Malaysia. Non-residents or offshore investors may also individually appoint ADIs that are RENTAS members as custodians of their investments. Most financial institutions are also members of the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which facilitates the efficient transmission and confirmation of cross-border payment and settlement instructions in foreign currencies.

3. Matching

3.1 Over-the-Counter Market

RENTAS provides local matching. The seller (or buyer) initiates unconfirmed settlement advice in RENTAS. The buyer (or seller) then confirms an unconfirmed settlement advice using the confirmation menu of RENTAS, concluding the local matching process. After confirmation, the seller and buyer can access the confirmation report in RENTAS.

3.2 Exchange Market

A central matching facility will be implemented in the fourth quarter of 2011 and expected to cover only bonds traded on the exchange, and settlement at BMD through the Institutional Settlement Service (ISS)[10] mode.

4. Settlement Cycle

From an infrastructure viewpoint, same-day settlement is available in the Malaysia bond market. Standard settlement cycle is T+1/T+2 from a market practice point of view for domestic transactions. For cross-border transactions, settlement cycle is generally T+2. But, some players adopt T+3.

5. Numbering and Coding

5.1 Numbering and Coding for Over-the-Counter Market and Exchange Market

5.1.1 Securities Numbering

International Securities Identification Number (ISIN) is used for securities numbering, but local securities codes prevail.

5.1.2 Financial Institution Identification

The Business Identifier Code (BIC) is used as part of a unique identifier code (UIC) for the participants.

5.1.3 Securities Account

The Securities Account Structure in RENTAS-SSDS is illustrated in Figure 6.1. Each participant has a primary securities account, a collateral account, as well as an unlimited number of optional customer sub-accounts.

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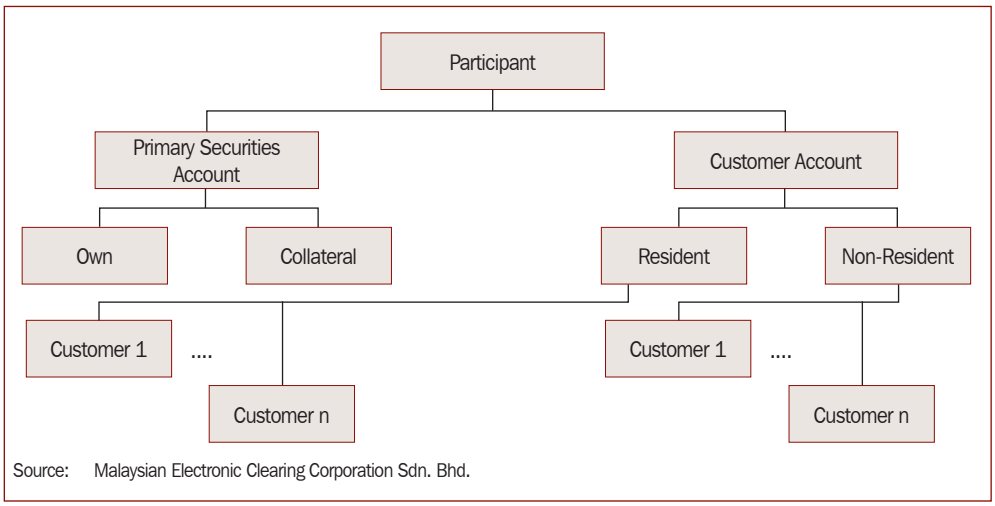
10 ISS is a service compliant with the Bank of International Settlement (BIS) DvP Model 2. BMSC acts as a CCP and guarantees payment and settlement.

Figure 6.1 Securities Account Structure in RENTAS

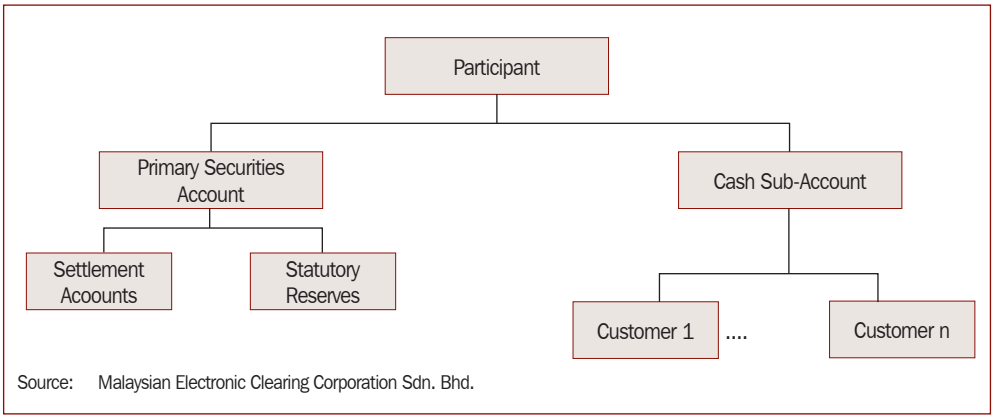


Source: Malaysian Electronic Clearing Corporation Sdn. Bhd.

5.1.4 Cash Account

The Cash Account Structure in RENTAS-IFTS is illustrated in Figure 6.2. Every participant has a primary settlement account, a statutory reserves account, as well as an unlimited number of optional sub-accounts.

Figure 6.2 Cash Account Structure in RENTAS



Source: Malaysian Electronic Clearing Corporation Sdn. Bhd.

5.1.5 Character Code and Language

Unicode UTF-8 is adopted. The language used for payment and settlement system is English.

6. Medium- to Long-Term Strategy

BM itself will soon access RENTAS directly. An initiative called the Common Platform Model for Asian Post-Trade Processing Infrastructure is underway, which is a cooperation between BM and the Hong Kong Monetary Authority.

Philippines (PHI)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

The Philippine bond market is comprised of the over-the-counter (OTC) market and the exchange market. According to OTC rules in Philippines, secondary trading of government and corporate bonds must be conducted through self-regulatory organizations (SROs). Therefore, trading participants of the markets should be members of an SRO. To date, the Philippines Dealing and Exchange Corporation (PDEx) is the only SRO in Philippines, and almost all transactions of bonds take place in with PDEx. It operates the Fixed Income (FI) Trading System, which includes two types of trading platform for debt securities: the Negotiated Dealing Platform and the Auto Match Platform. The Negotiated Dealing Platform is primarily for professional markets with relatively large trading transactions while the Auto Match Platform caters to the public market (through broker participants) with smaller volume.

The Bureau of Treasury (BTr) is the central securities depository (CSD) for government bonds (Treasury bills and Treasury bonds). BTr owns and operates the Registry of Scripless Securities (BTr-RoSS), which is the official registry of absolute ownership, legal or beneficial titles or interest in government bonds. Hence, all government bond transactions are finally settled in BTr-RoSS. The Philippines Depository and Trust Corporation (PDTC) is the CSD for corporate bonds. It also acts as a sub-registry for government bonds in some cases.

After the trade is executed in the FI Trading System, the trade data is sent to BTr-RoSS via PDEx-RoSS straight-through processing (STP) facility or the electronic delivery–versus-payment (eDvP) System. The FI Trading System automatically chooses the system used for the settlement process—either through the PDEx-RoSS STP Facility or the eDvP System—according to the parties involved in a trade.

The PDEx-RoSS STP Facility is for government securities eligible dealers (GSEDs) and transmits trade data directly to BTr-RoSS. The eDvP System is for non-GSEDs and transmits trade data to PDTC.

The cash settlement is performed on Philippine Payment and Settlement System (PhilPaSS), which is owned and operated by the Bangko Sentral ng Pilipinas (BSP). When trading participants do not have an account with BSP, other settlement banks will be involved.

Please refer to Part 3, Figure G.1 for the bond market infrastructure diagram.

1.2 Description of Related Organizations

Philippine Dealing and Exchange Corporation (PDEx)

PDEx is licensed by the Securities and Exchange Commission (SEC) as an exchange under the provisions of the *Securities Regulation Code* (SRC). PDEx is an operating subsidiary of the Philippine Dealing System Holdings Corporation (PDS Group).

Bureau of Treasury (BTr)

BTr is the CSD for government securities (Treasury bills and government bonds), and owns and operates the BTr-RoSS.

Philippine Depository and Trust Corporation (PDTC)

PDTC was founded as the CSD in the Philippines bond market in 1995. It is owned by the PDS Group. PDTC provides depository and settlement services for equities, such as common shares that may be classified as A and B, preferred shares, warrants, and depository receipts, commercial papers, private bonds, and government securities.

Bangko Sentral ng Pilipinas (BSP)

BSP is the central bank of the Republic of the Philippines. It was established on 3 July 1993. It provides the PhilPaSS and acts as a cash settlement entity in the bond market.

1.3 Trading

1.3.1 Over-the-Counter Market

In March 2005, the Fixed Income Exchange (FIE) was established in the Philippines. FIE is operated by PDEx, which is tasked to operate and maintain the trading system for fixed-income securities and its derivatives. It runs the FI Trading System (Negotiated Dealing Platform). Its member brokers and dealers are only allowed to engage in OTC transactions. When a seller and a buyer arrange or negotiate a trade outside the FIE, they have to execute the trade on the FI Trading System within 1 minute from conclusion of negotiation.

Traders can communicate, negotiate and deal transactions from their respective offices,and the system ensures that all information sent to each transacting party is kept confidential and cannot be viewed by the public.

1.3.2 Exchange Market

In February 2008, PDEx launched the Auto Match Dealing Platform where broking participants can post orders received from retail investors. With this platform, retail investors are given equal access to the various fixed income securities listed on the trading board. The transactions on this platform are captured automatically and broadcast on real-time basis.

1.4 Central Counterparty Clearing

1.4.1 Central Counterparty Clearing for the Over-the-Counter Market

There is no CCP for the OTC market.

1.4.2 Central Counterparty Clearing for the Exchange Market

There is no CCP for the exchange market.

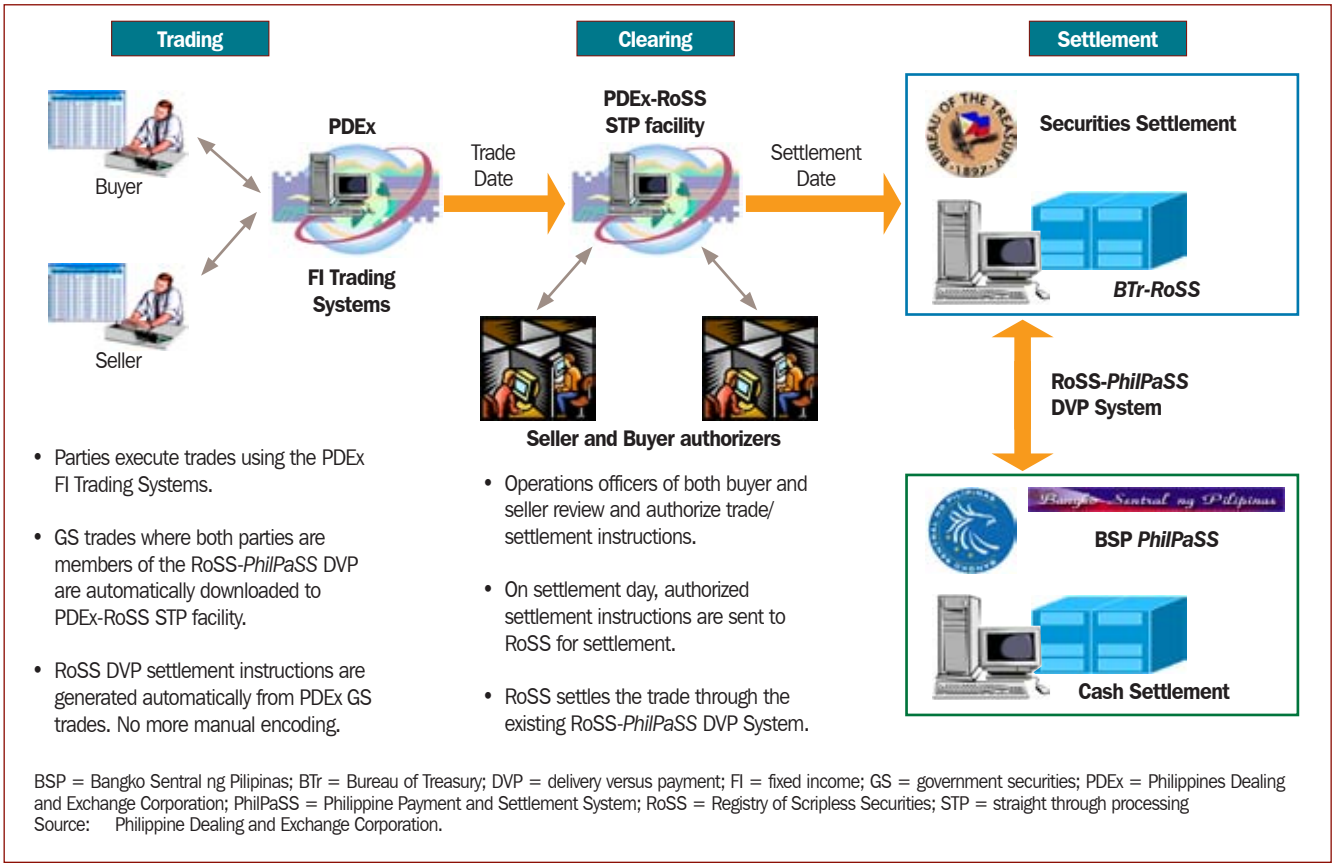
1.5 Bond Settlement

1.5.1 Bond Settlement at the Bureau of Treasury-Registry of Scripless Securities

The Bureau of Treasury (BTr) is the CSD for government securities. BTr established the BTr-RoSS for depository and settlement of government securities in November 1996. BTr-RoSS settles transactions in delivery-versus-payment (DVP) Model 1 under the Bank of International Settlement (BIS) definition. BTr-RoSS checks the securities in the seller's securities account and earmarks these for transfer. After the cash settlement is processed, BTr-RoSS will transfer the earmarked securities from the seller's securities account to the buyer's.

The settlement process in Philippine bond market is varied according to the kinds of trade participants as the following figures show. The settlement process for government bond trades where both parties are GSEDs is shown as follows.

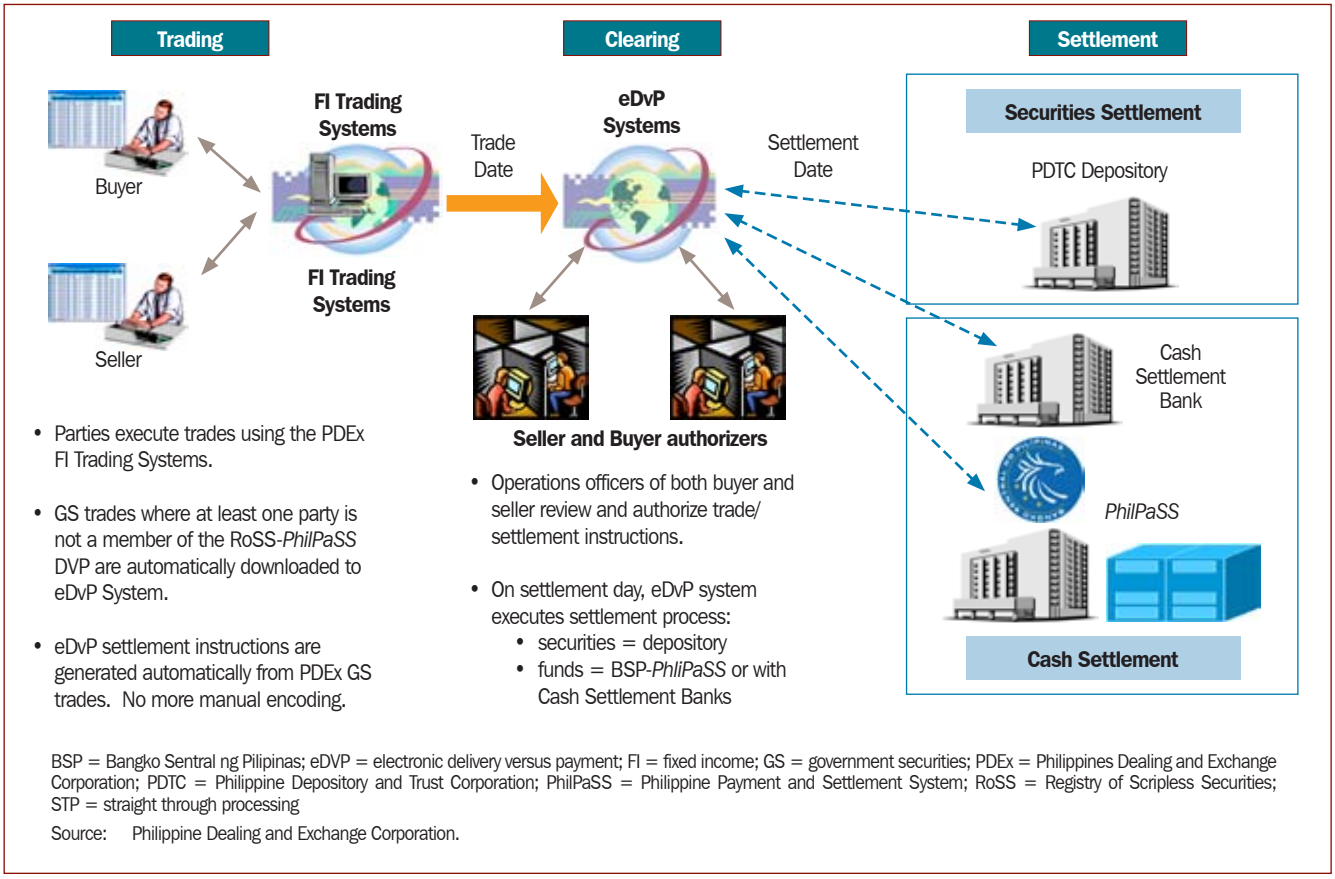
Figure 7.1 Settlement through RoSS-PhilPaSS DVP



BSP = Bangko Sentral ng Pilipinas; BTr = Bureau of Treasury; DVP = delivery versus payment; FI = fixed income; GS = government securities; PDEx = Philippines Dealing and Exchange Corporation; PhilPaSS = Philippine Payment and Settlement System; RoSS = Registry of Scripless Securities; STP = straight through processing
Source: Philippine Dealing and Exchange Corporation.

The settlement process for all corporate bond trades and government bond trades where one or both parties are non-GSED is shown as follows.

Figure 7.2 Settlement Process for Corporate Bond Trades and Government Bond Trades



BSP = Bangko Sentral ng Pilipinas; eDVP = electronic delivery versus payment; FI = fixed income; GS = government securities; PDEx = Philippines Dealing and Exchange Corporation; PDTC = Philippine Depository and Trust Corporation; PhilPaSS = Philippine Payment and Settlement System; RoSS = Registry of Scripless Securities; STP = straight through processing

Source: Philippine Dealing and Exchange Corporation.

1.5.2 Bond Settlement on the Philippine Depository and Trust Corporation

For corporate bonds and non-dealer government securities trades, the PDTC provides depository and settlement services as a CSD. PDTC adopts the DVP Model 1 under BIS definition. The proprietary network without specific name is used and the types of lines are Internet and point-to-point leased line. The protocol used is Hypertext Transfer Protocol Secure (HTTPS). The interface is browser-based, e.g., Internet Explorer, and the message format is proprietary.

1.6 Cash Settlement

1.6.1 Cash Settlement Using Central Bank

Trade between GSEDs is settled by a central bank account. BSP provides the Philippines's real-time gross settlement (RTGS) system, which is called PhilPaSS. All GSEDs have their accounts of BTr-RoSS for bond settlement and accounts of BSP PhillPass for cash settlement. In this case, the RoSS-PhilPass DVP system sends settlement data to BSP-PhilPass. Cash settlement is made through the debit or credit of the GSEDs accounts. BSP also provides an intraday overdraft facility.

1.6.2 Cash Settlement using Cash Settlement Bank

When one or both parties of trade are non-GSEDs, and both do not have a BSP account, the trade is settled with a cash settlement bank.

2. Typical Business Flows

2.1 Delivery-Versus-Payment Flow for the Over-the-Counter Market (Government Securities Eligible Dealers)

Please refer to Part 3, Figure G.2 on the bond transaction flow for domestic trades in the GSEDs market (DVP).

2.2 Delivery-Versus-Payment Flow for the Over-the-Counter Market (Including Non-Government Securities Eligible Dealers)

Please refer to Part 3, Figure G.3 on the bond transaction flow for domestic trades in the non-GSEDs market (DVP).

2.3 Delivery-Versus-Payment Flow for Cross-Border Trade

The domestic leg settlement is handled like any other domestic trade, with the foreign investor represented locally by a custodian or a dealer trading participant. The process of delivery to or collection from the foreign investor is bilaterally arranged but all modes entail foreign exchange registration with the central bank.

Transaction cost for cross-border clients can range from $15 to $30, which covers both cash and securities transactions and the Bangko Sentral Registration Document (BSRD) processing, reporting and monitoring. Redemption is treated as a free-of-payment (FOP) transaction. The transaction and account maintenance fees should generally cover all services. There would also be an account maintenance fee which ranges from 1.5 basis points (bps) to 3 bps per annum based on future value (FV) and inclusive of depository fees and taxes.

Please refer to Part 3, Figure G.6 on bond transaction flow for foreign investors in the OTC market (DVP).

3. Matching

The seller and buyer send instructions to PDEx and PDEx, through the FI Trading System, matches order from the seller and the buyer. PDEx, through the PDEx-RoSS STP Facility sends settlement data to BTr-RoSS. PDEx FI trades are already matched when sent to the clearing system for DVP settlement. PDEx operates a post-trade clearing facility, with STP from the trading systems, for counterparties to confirm their settlement obligations prior to settlement. Therefore, CSD matching is used only for non-exchange trades. The depository provides both local and central matching capabilities either for inputting or uploading of transactions. Local matching is applicable only to FOP transactions while DVP instructions are used in central matching.

4. Settlement Cycle

All PDEx trades settle on a DVP basis typically on a T+1 settlement cycle for domestic transactions. For cross-border transactions, the settlement cycle depends on the custodians involved. The most prevailing settlement cycle may be T+3 for cross-border transactions. FOP transactions are settled in real-time mode upon execution and confirmation of transfer instructions either at the registry or at the depository.

5. Numbering and Coding

5.1 Numbering and Coding for the Over-the-Counter and Exchange Markets

5.1.1 Securities Numbering

The International Securities Identification Number (ISIN) is used for government securities, except for special purpose Treasury bonds and multi-currency retail Treasury Bonds. Local numbering is also used for most of bond transactions.

5.1.2 Financial Institution Identification

Both Business Identifier Code (BIC) and local code are used. PDS-assigned firm codes are used to identify the financial institution in its trading, depository and settlement systems. However, mapping tables are used to convert these codes to their BIC equivalents when PDS systems interact with central bank or cash settlement bank systems.

5.1.3 Securities Account

The securities account is in text format and using ISO 20022.

5.1.4 Cash Account

The BIC code of the bank and the regular bank account number are used to identify cash accounts.

5.1.5 Character Code and Language

UTF 8 is used for all the trading, depository and settlement systems. The language for payment and settlement is English.

6. Medium- to Long-Term Strategies

The PDS Group and regulators (BSP and SEC) are very conscious about promoting STP whenever possible. While there is no official initiative tasked to implement STP, each financial institution plans to mitigate risks and reduce operational costs. They are promoting STP in the following areas:

- Between trading system and the back-office systems of trading participants
- From trading systems to the clearing and settlement systems
- Between depository system and the back-office systems of depository participants
- Between the depository and the registry systems both for government and corporate bonds

- Between the depository or registry systems and the settlement bank systems for linkages with other depositories

Each institution implements STP using proprietary conventions. For example, interfaces to settlement banks' deposit systems are governed by each bank's proprietary solution. This results in the feeder institution (such as the depository) having to customize the interface for each settlement bank which it connects to. The development of specific interface program for each connectivity point translates to multiple development and maintenance cost and increased operational risk. It is applicable that an industry-wide initiative streamlines STP connectivity requirements and promotes to use a centralized infrastructure (such as an STP "hub"). Regulators could set deadlines for companies to be ISO 20022 compliant.

Singapore (SIN)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

Singapore's bond market is comprised of the over-the-counter (OTC) market and the exchange market. Singapore government securities (SGS) are traded on the OTC market, whereas corporate bonds are mainly traded on the Singapore Exchange (SGX), too. Settlement of SGS is performed via the Monetary Authority of Singapore (MAS) Electronic Payment System plus (MEPS+) SGS, and settlement of corporate bond is performed via the Debt Securities Clearing and Settlement System (DCSS). MEPS+ real-time gross settlement (RTGS) has a cash settlement function of full range of bonds.

Please refer to Part 3, Figure H.1 for the bond market infrastructure diagram.

1.2 Description of Related Organizations

The Monetary Authority of Singapore (MAS)

MAS is the central bank of Singapore, which acts as the agent for the Government of Singapore in issuing SGS that comprise of Treasury bills (T-bills) and government bonds. It provides overall supervision of the financial industry, including the securities industry, and operates a bond settlement and registry system (MEPS+ SGS) to facilitate the trading of Singaporean government debt. The book-entry system (MEPS+ SGS) is linked to the MEPS+ RTGS.

The Singapore Exchange (SGX)

SGX is a self-regulating organization governed by its own rules and by-laws, but ultimately supervised by the MAS. SGX was formed on 1 December 1999 as a holding company of some former exchange companies such as the Stock Exchange of Singapore (SES), Singapore International Monetary Exchange (Simex), and the Securities Clearing and Computer Services Pte. Ltd. (SCCS). The Tokyo Stock Exchange Group, Inc. holds about 4% of the stock while SGX holds a 20% stake in the Philippine Dealing System Holdings Corporation (PDS Group), which has become an associated company of SGX.

The Central Depository (Pte.) Limited (CDP)

CDP, which was established in 1980 and commenced operations in 1987, is wholly owned by the SGX. Settlement through the CDP is compulsory for all transactions of listed securities. The CDP, through its DCSS, is the depository for eligible private sector debt. DCSS-eligible securities are restricted to new, Singapore dollar-denominated private sector debt issues. The CDP provides clearing functions for corporate bonds, derivatives, and equities.

1.3 Trading

1.3.1 Over-the-Counter Markets

SGS are mainly traded in the OTC market. All trade confirmations for SGS are performed through the MEPS+ SGS. The seller keys in all the trade detail into MEPS+ SGS, which is then affirmed by the buyer. The buyer and seller have an option to choose either delivery-versus-payment (DVP) or free-of-payment (FOP) based settlement (most of them settled by DVP) in the MEPS+ SGS. As SGS are in the scripless form, ownership and transfer of SGS are reflected as book entries in the bank's custody account with MAS.

Corporate and statutory bonds are also traded in the OTC market. Transactions are cleared and settled through the online DCSS.

1.3.2 Exchange Markets

Bonds which are listed are traded on the SGX. The corporate bond market in Singapore is regulated by the SGX. Corporate bonds are traded on the Bond Quotation System of the SGX. The trading system of SGX links directly with DCSS, which is operated by the CDP. Taking effect beginning 8 July 2011, investors can trade SGS bonds in the secondary market on the SGX.

1.4 Central Counterparty Clearing

There is no central counterparty clearing (CCP) function for the OTC and exchange bond markets.

1.5 Bond Settlement

1.5.1 Bond Settlement on the Over-the-Counter Market

SGS are settled via book-entry movements within participant accounts at the MAS. Trade instructions are submitted by the delivering party and receiving counterparty to MEPS+ SGS by 5:30 p.m. on settlement day (SD). Upon matching, securities and cash are transferred between participants on a simultaneous, trade-by-trade basis. Settlement is completed on T+3 against MEPS+ payment.

The MEPS+ SGS system holds government bonds and facilitates the instantaneous and irrevocable transfer of SGS. It is linked to the MEPS+ RTGS system to provide DVP for SGS transactions. Under the scripless settlement system, crediting or debiting the securities owner's account through the book-entry system effects any transfer of securities. Most of SGS transactions are settled through DVP over MEPS+ SGS and MEPS+ RTGS.

If the seller of SGS has insufficient SGS for delivery, the transaction is queued in MEPS+ SGS until sufficient SGS is made available in the seller's SGS account. When the seller's SGS account has sufficient SGS, the SGS is earmarked for transfer to the buying bank, and a payment instruction is sent to MEPS+ RTGS for funds settlement.

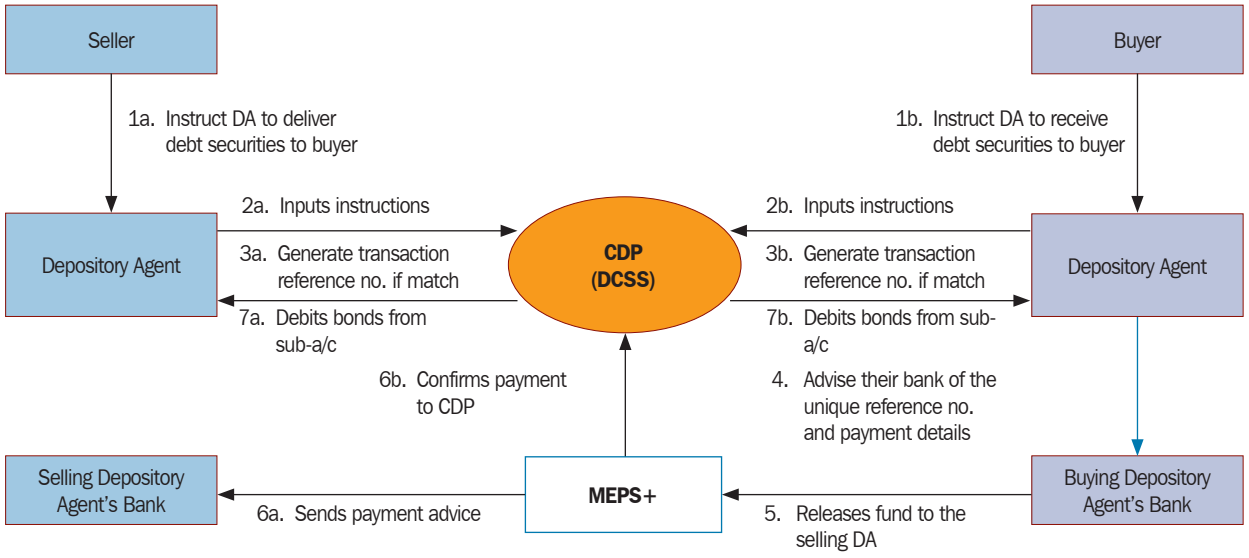
1.5.2 Bond Settlement on the Exchange Market

The DCSS is an electronic book-entry system and a facility for clearing and settlement of transactions in the OTC market in Singapore dollar-denominated private debt securities. It is operated by the CDP, which is a depository and a designated clearing house. Transactions can be settled on a DVP or FOP basis. Exchange-listed corporate debt securities are mostly settled on a DVP basis. CDP does not act as the central counterparty for such trades, and no netting is carried out. Both the buyer and seller input the settlement instruction, containing key details of the trade into the DCSS. Upon matching of the settlement instructions, the seller's debt securities are earmarked and the transaction proceeds to settlement. Matched instruction can only be revoked by the buyer.

For DVP settlement, transactions are settled on a real-time basis. Funds are transferred via MEPS+, and securities are simultaneously transferred via the DCSS book-entry system on a gross trade-for-trade basis. The real-time DVP arrangement is achieved through a live leased-line link between DCSS and MEPS+. For FOP settlement, transacting parties use CDP only for securities transfer and arrange for funds transfer separately.

The transaction flow of DCSS is illustrated below.

Figure 8.1 Transaction Flow of Debt Securities Clearing and Settlement System



CDP = Central Depository (Pte.) Limited; DA = depository agent; DCSS = Debt Securities Clearing and Settlement System; MEPS+ = Monetary Authority of Singapore Electronic Payment System plus (MEPS+)

Source: Monetary Authority of Singapore.

1.6 Cash Settlement

All types of bonds utilize MEPS+ RTGS for cash settlement. MEPS+ RTGS and MEPS+ SGS are directly linked for cash settlement of SGS. If the buying bank has insufficient funds to pay for the SGS purchase, the payment is queued in the MEPS+ RTGS. When the funds become available, the amount is debited from the buyer's RTGS account and credited to the seller's RTGS account. The MEPS+ RTGS simultaneously notifies the MEPS+ SGS to transfer the securities to the buyer.

Cash settlements for corporate bond trades also occur in MEPS+ RTGS. Funds are transferred via MEPS+ RTGS while securities are simultaneously transferred via the DCSS book-entry system on a gross trade-by-trade basis. A real-time DVP arrangement is achieved through a live leased-line linkage between DCSS and MEPS+ RTGS.

2. Typical Business Flows

2.1 Delivery-versus-Payment Flow for the Singapore Over-the-Counter Market

Please refer to Part 3, Figure H.2 for the bond transaction flow for domestic trades on the OTC market (DVP).

2.2 Delivery-versus-Payment Flow for Cross-Border Bond Transactions

Please refer to Part 3, Figure H.3 the bond transaction flow for foreign investors on the OTC market (DVP).

3. Matching

For SGS transactions from the OTC market, MEPS+ SGS provides local matching. The seller or buyer enters trade data to the MEPS+ SGS system. The system then transmits the data to the counterparty. If the data are correct, the counter party sends them back to the MEPS+ SGS for affirmation. Then, the SGS transactions are regarded as matched.

4. Settlement Cycle

The settlement cycle of SGS and corporate bonds is can be T+1, but is commonly contracted at T+3.

5. Numbering and Coding

5.1 Numbering and Coding for the Over-the-Counter Market and Exchange Market

5.1.1 Securities Numbering

The International Securities Identification Number (ISIN) is used in the Singapore bond market.

5.1.2 Financial Institution Identification

MEPS+ SGS and MEPS+ RTGS adopt the Society for Worldwide Interbank Financial Telecommunication (SWIFT) Business Identifier Code (BIC) to identify financial institutions. MEPS+ SGS and MEPS+ RTGS non-participant member code can either use its SWIFT BIC or an eight-character code assigned by MAS.

5.1.3 Securities Account

Securities account uses proprietary numbering. There are three types of SGS accounts in MEPS+ SGS—SGS Reserve account, SGS Trade account, and SGS Customer account.

SGS-Reserve Account

Banks would deposit SGS for compliance with the Minimum Liquid Assets (MLA) requirement to hold at least 10% of the qualifying liabilities (QL) in SGS at all times in this account prior to the start of the 2-week maintenance period. Banks may not sell SGS in the SGS-MLA account directly. To give banks the flexibility to manage their holdings of SGS issues, transfers of SGS holdings between the SGS-Reserve account and the SGS-Trade account can be made at any time when the MEPS+ SGS is in operation, subject to the 7:00-p.m. deadline for same-day transfers. Transfers of SGS holdings out of the SGS-Reserve account to the SGS-Trade account are permitted only if the remaining value of SGS holdings in the SGS-Reserve account after the transfer is at least 10% of QL. Transfers to or from the SGS-Reserve account will not be queued for settlement, i.e., if there is insufficient securities in the account (either SGS-Trade or SGS-Reserve accounts) to be transferred out, and the transaction will be rejected.

SGS-Trade Account

SGS holdings in excess of the minimum 10% MLA requirement may be deposited in the SGS-Trade account. SGS holdings in this account can be used for trading.

SGS Customer Account

Primary and approved SGS dealers maintain an additional SGS Customer account for the SGS holdings of their customers. Holdings in a Customer account can be transferred FOP to the bank's SGS holdings, or to another bank's or its customer's SGS holdings. Purchases or sales on delivery against payment of SGS holdings in a bank customer's account from and/or to another bank or its customer's SGS holdings can also be transacted.

5.1.4 Cash Account

Cash account uses proprietary numbering.

Participants are required to maintain current account with MAS. Banks' intraday Minimum Cash Balance (MCB) requirement, if any, is maintained in the Current Account.

Funds in the Current Account exceeding the intraday MCB requirement are transferred at the start of the day to the participant's RTGS account in MEPS+ RTGS, where they may be used for the settlement of interbank payments.

5.1.5 Character Code and Language

UTF-8 (Unicode) is adopted and English is chosen as a standard language for payment systems in Singapore.

Thailand
(THA)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

The Thai bond market is composed of the over-the-counter (OTC) market and the exchange market. Unlisted bonds are largely traded under the OTC market while listed bonds are traded through the Stock Exchange of Thailand (SET). More than 95% of bonds are traded in the OTC market. Traded data are entered into Post-Trade Integration (PTI) and settled using the PTI, which is the book-entry system of bonds in Thailand. PTI is owned and operated by SET and shared by the Thailand Clearing House (TCH) and the Thailand Securities Depository (TSD), which are subsidiaries of the SET. Cash settlement is effected through the Bank of Thailand Automated High-Value Transfer Network (BAHTNET) which is the RTGS system owned, operated and regulated by the Bank of Thailand (BOT).

Please refer to Part 3, Figure I.1 for the bond market infrastructure diagram.

1.2 Description of Related Organizations

The Stock Exchange of Thailand (SET)

SET is the stock exchange of Thailand and was established with the enactment of a legislation passed in May 1974. On 30 April 1975, the SET officially started trading. On 1 January 1991, its name was formally changed to "The Stock Exchange of Thailand" (SET).

The Bond Electronic Exchange (BEX)

BEX is a subsidiary of SET and was launched on 26 November 2003. BEX's main role is to support the secondary market for bond trading. As majority of bond trading are in the OTC market, therefore, BEX's objective is to expand bond activities to individual investors.

The Thai Bond Market Association (BMA)

BMA is a securities business related association under the *Securities and Exchange Commission Act B.E. 2535*. Its main purposes are to be a self-regulatory organization (SRO) for a fair and efficient operation of the bond market and to be an information center for the Thai bond market. As a pricing agency, BMA provides Thai bond prices

to Bloomberg and Reuters; in return, it receives trade details via Bloomberg's FIRST online capture. The BOT stipulates that every bond dealer has to be BMA member.

The Thailand Clearing House Co. Ltd. (TCH)
TCH, a subsidiary of SET, was established on 9 August 2004, with a registered capital of THB100 million. During 2004–2009, TCH acted as a clearinghouse or a center for clearing derivatives traded in the Thailand Futures Exchange (TFEX). Through the clearing house integration plan and intention to segregate risk associated with clearinghouse role from depository function, the TSD, which had acted as clearinghouse for equity and bond since 1 January 1995, has transferred clearing and settlement functions for equity and bond to TCH from 2010 onwards. Thus, TCH will become the integrated clearing house for all financial products. The TCH is governed by the *Securities and Exchange Act B.E. 2535 (1992)* for equity and bond, and the *Derivatives Act B.E. 2546 (2003)* for derivatives. It is under the supervision of the Securities and Exchange Commission (SEC).

The Thailand Securities Depository Co., Ltd. (TSD)
TSD is a subsidiary of SET and was established on 16 November 1994. TSD is the sole central securities depository (CSD) in Thailand using a scripless system.

The Bank of Thailand (BOT)
The BOT was first set up as the Thai National Banking Bureau. The *Bank of Thailand Act* was promulgated on 28 April 1942 vesting upon the BOT the responsibility for all central banking functions. The BOT started operations on 10 December 1942. It developed an electronic large-value funds transfer, known as BAHTNET. It is designed to mitigate risk in payment systems to facilitate settlement in effective, secured and timely manner on real-time gross settlement (RTGS) basis since 24 May 1995.

1.3 Trading

1.3.1 Over-the-Counter Markets

Most trading takes place on the OTC market, where quotes are typically obtained directly from money brokers and dealers over the phone. An agreement concluded over the telephone is then followed up with a confirmation order in writing. An investor can place an order with a dealer at his desired price and amount. However, the trade is concluded when the dealer can find a corresponding seller in the OTC market.

Dealers have to report trade details to the BMA, as the pricing authority, within 30 minutes. BMA publishes trade reports for government securities upon receipt and twice daily for corporate bond trades.

1.3.2 Exchange Markets

Trading Fixed Income Instruments on the Exchange
BEX was established to provide investors with additional investment instruments. In addition to a better access to information for investors, BEX will also provide investors with an ease to conduct trading transactions. BEX enhances the bond's secondary market. Prior to BEX, bonds were traded on the OTC market, which was mainly the institutional investor's arena. Small investors were unable to get into that particular market due to its size and its ambiguity, or simply the lack of information.

BEX is currently working under the trade-by-price method. However, the committed price will be converted into indicative yield to assist in decision making. The commission fee associated with bond trading required by brokerage companies is not fixed and subject to negotiation between the investors and their respective brokers. Dealers have to report trades to the BMA within 30 minutes in similar ways on the OTC market.

1.4 Central Counterparty Clearing

1.4.1 Central Counterparty Clearing for the Over-the-Counter Market

There is no clearing function for the OTC bond market.

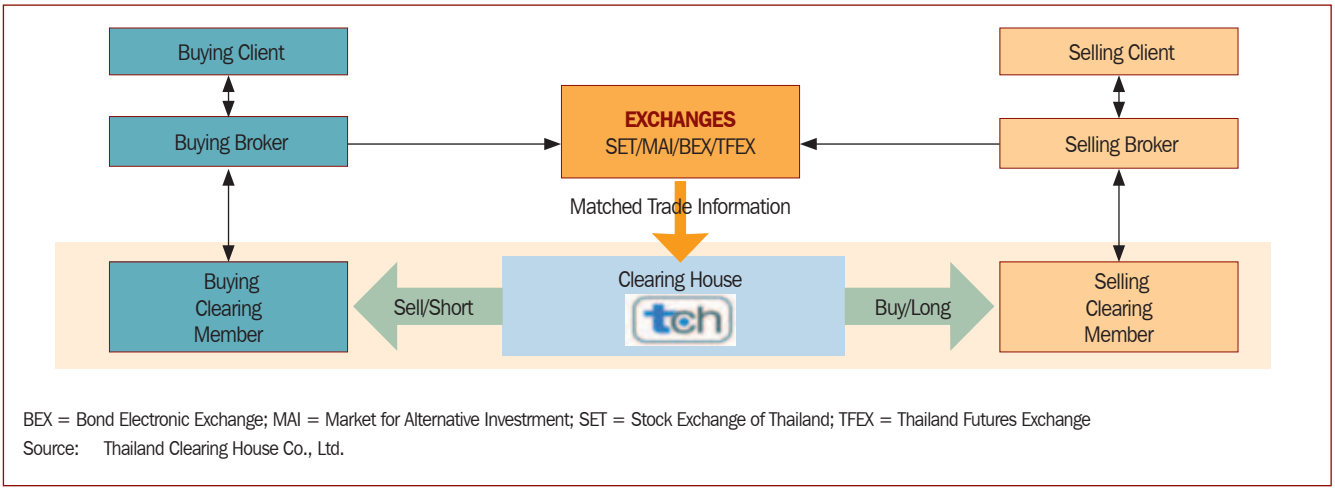
1.4.2 Central Counterparty Clearing for the Exchange Market

TSD administers clearing and settlement process. Currently, it takes 2 working days to complete the clearing and settlement transaction once the order has been executed. To simplify the procedure, investors are encouraged to make scrip deposit to TSD prior to any deal taking place. Right after a trading transaction is matched and those exchanges have confirmed the matching transactions with their members, the TCH, as the direct central counterparty (CCP), will become a buyer to every selling member and a seller to every buying member. Therefore, a member who has bought or sold the securities has an obligation not to the party on the other side of the transaction, but to the clearinghouse, just as the clearinghouse has an obligation to the member. This is called a novation process.

As a CCP, TCH guarantees the performance of payment and securities delivery of any trading transactions on SET (BEX). This reduces the risks stemming from clearing members who fail to meet their contractual obligations or 'credit risks', thereby strengthening the confidence in and by the involved parties, as well as preserving the financial integrity of the clearinghouse and the market as a whole. However, the TCH does not guarantee the payment and securities delivery for gross settlement transaction.

The role of the TCH is illustrated as follows.

Figure 9.1 Role of the Thailand Clearing House



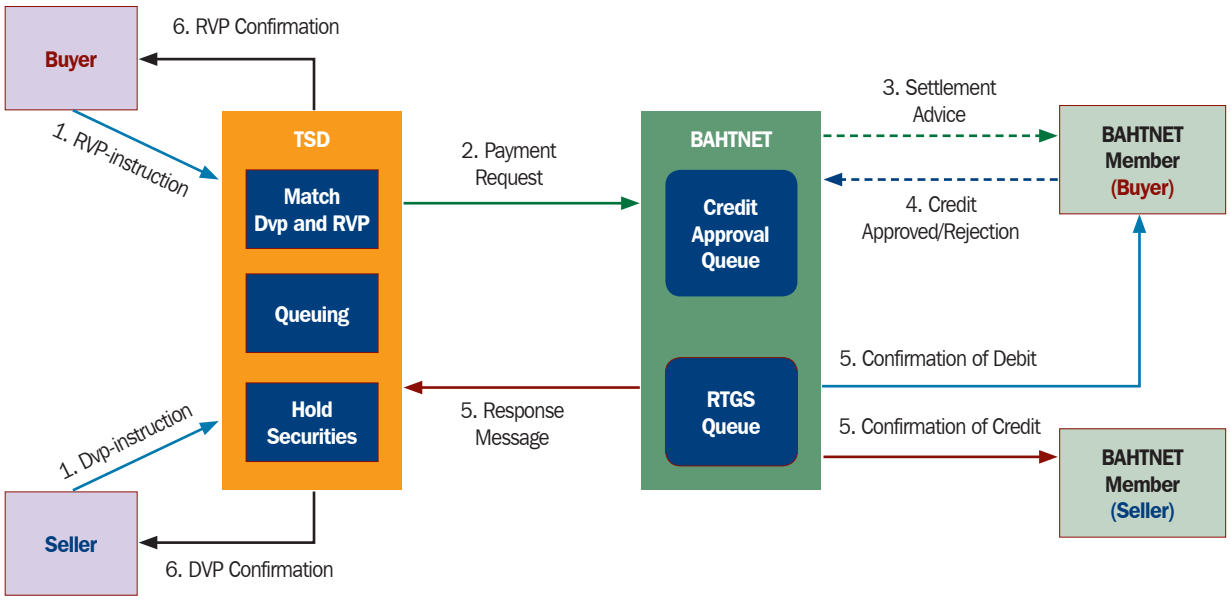
BEX = Bond Electronic Exchange; MAI = Market for Alternative Investment; SET = Stock Exchange of Thailand; TFEX = Thailand Futures Exchange
Source: Thailand Clearing House Co., Ltd.

1.5 Bond Settlement

Bonds are settled via the PTI system on the RTGS basis. The buyer and seller send the settlement instructions to PTI. Once they are matched, TCH sends the instruction to TSD to withhold the bonds in the seller's account. TSD also sends the instruction to the BOT to settle the money. After the money settlement is completed, TSD transfers the bond from the seller's account to buyer's account.

PTI as core system combines settlement-depository-registration functions and features. PTI allows for STP, integrates with BAHTNET, and includes FOP transactions. PTI's messaging is based on Society for Worldwide Interbank Financial Telecommunication (SWIFT) messages. PTI uses the International Securities Identification Number (ISIN) and Business Identifier Code (BIC), but a converter exists to local codes. Participants can utilize web-based capture, and uploading is possible. Each market participant must have PTI terminals. A PTI system is a standalone system, with no interface with market participants' systems.

Figure 9.2 Process for Gross Settlement for DVP



DVP = Delivery versus Payment; RVP = Receive versus Payment; RTGS = Real Time Gross Settlement
Source: Stock Exchange of Thailand.

1.6 Cash Settlement

Cash settlement uses BAHTNET. BAHTNET is an irrevocable funds transfer system, which operates on RTGS basis. BAHTNET is linked with TSD's system to facilitate delivery versus payment (DVP) for government securities. Intraday Liquidity Facility (ILF), which provides intraday overdraft, is available for the BAHTNET members under BOT supervision. BAHTNET also provides a quieting mechanism and gridlock resolution system to provide adequate liquidity for cash settlement. As a high-value payment system, BAHTNET has implemented sufficient level of security measures such as digital signature based on private keys and smart cards to secure integrity, confidentiality, authentication, and non-repudiation including

audit trail. Regarding foreign exchange control, currently, non-residents can open two types of Baht accounts with commercial banks: Non-resident Baht Account for Securities (NRBS) and Non-resident Baht Account (NRBA). NRBS must be used for investment in securities and other financial instruments in Thailand (such as equity instruments, debt instruments, unit trusts, and exchange traded derivatives), as well as any payments relating to such investment (e.g., tax payment relating to securities investment, brokerage fee, and custodian fee). NRBA is for general purposes other than those of NRBS. Outstanding balances of each type of account at the end of each day shall not exceed the limit of THB300 million per non-resident, which includes balances of all accounts opened by each non-resident with all financial institutions in Thailand.

2. Typical Business Flows

2.1 Delivery-versus-Payment Transaction Flow for Domestic Trade in the Over-the-Counter Market

Please refer to Part 3, Figure I.2 for the bond transaction flow for domestic trades in the OTC market (DVP).

2.2 DVP Transaction Flow for Cross-border Trade

Please refer to Part 3, Figure I.3 for the bond transaction flow for foreign investors in the OTC market (DVP).

3. Matching

The automatic matching system for settlement transaction is used. The system checks if the DVP instruction can be matched with other receive-versus-payment (RVP) instructions according to the pre-specified matching fields. The PTI system already uses central (two-side trade input) matching. This method is preferable as market participants can input the instructions to the system in advance and the system matches automatically with the specified date. In addition, most of participants in bond settlement are banks which already use SWIFT messages so they can forward the instructions to the system without having to re-key in.

4. Settlement Cycle

Although the bond settlement system can be on real-time basis, most of market participants settle bond on T+2. In addition, bond trading in BEX is also settled on T+2. In the case of an investor from the United States, the settlement cycle is T+3.

5. Numbering and Coding

5.1 Numbering and Coding for the Over-the-Counter Market

5.1.1 Securities Numbering

ISIN is used for bond trade but, local numbering is also used.

5.1.2 Financial Institution Identification

BIC code is used for financial institution identification. However, proprietary code is also used.

5.1.3 Securities Account

ISO 20022 is not adopted in Thai bond market. The settlement system uses proprietary account numbers to transfer the bond.

5.1.4 Cash Account

The International Bank Account Number (IBAN) is not used. Since market participants are banks and the fund is settled via the BOT system, participants then use the BOT account number as reference to transfer funds.

5.1.5 Character Code and Language

SWIFT format is used as the character code for bond and cash instructions. English is adopted as the standard language for payment systems.[11]

6. Medium- to Long-Term Strategy

Currently, STP is already implemented for bond transactions. Most of the bonds are traded on the OTC market. After entering to the PTI of TCH, traded data are processed automatically without significant manual intervention, except necessary affirmation. As such, domestic bond settlement process is sufficiently automated. Regarding cross-border trade, messages are compliant with ISO 15022 and have high potentiality to be processed with less manual intervention of custodians. Adoption of ISIN and BIC may have some advantage to be directly connected with other CSDs in the near future.

In the very near future, both government and corporate bonds will be listed on the BEX. While, currently, only publicly listed companies' bonds are allowed to trade on BEX, non-listed companies will soon be able to have their bonds traded on the exchange as well. However, there is no electronic trading platform for the Thailand bond market. In 2010, BMA signed a multilateral memorandum of understanding with four key authorities namely, the BOT, the Public Debt Management Office, and the SET and Securities and Exchange Commission to establish the Thailand Financial Instruments Information Center (TFIIC), an infrastructure project under the Capital Market Development Master Plan 2009–2014. The TFIIC will centralize storage of financial instruments date and information for public access and cross-agency sharing within domestic financial markets.

11 SWIFT format is based on UTF-8.

Viet Nam
(VIE)

1. Bond Market Infrastructure

1.1 Overview of Bond Markets

In Viet Nam there are two bond markets which are the over-the-counter (OTC) market and the stock exchange market. Most of the bonds are firstly traded on the OTC market bilaterally by phone or some other measures similar to other countries in ASEAN+3. All traded data are entered into the stock exchanges. There are two stock exchanges in Viet Nam: the Hanoi Stock Exchange (HNX) and the Hochiminh Stock Exchange (HOSE). HNX was established in 2005 and started handling government bonds in 2009. All traded government bonds are entered into HNX since then. Unlisted bonds are also traded on the OTC market though the trading volume and value are very small compared to those of listed bonds. As such almost all bonds are entered to the stock exchanges. Government bonds (government bond, government-guaranteed bond, and municipal bond) and foreign currency-denominated bonds traded in the Specialized Government Bond Market are processed and operated at the HNX. Corporate bonds listed on HNX and HOSE are dealt on the two exchanges.

The definition of trade date in Viet Nam is different from other ASEAN+3 markets. In Viet Nam, the date traded data are entered to the HNX is regarded as the trade date instead of the date when the bond is actually traded and agreed upon by phone or some other measures. As such, the standard settlement cycle in the Viet Nam bond market is T+1 according to proprietary practices. This means settlement cycle T+2 or T+3 is in accordance with standard market practice.

The Vietnam Securities Depository (VSD) is the central securities depository (CSD) for all bonds listed in the HNX and HOSE. Bond transactions are cleared by VSD and VSD is in charge of bond delivery and the Bank for Investment Development of Vietnam (BIDV) is in charge of fund transfer (cash settlement) using delivery versus payment (DVP) subject to the clearing result sent by VSD.

Please refer to Part 3, Figure J.1 for the bond market infrastructure diagram.

1.2 Description of Related Organizations

Hanoi Stock Exchange (HNX)

HNX is a government-owned and -operated exchange under the oversight of the State Securities Commission (SSC). HNX serves as the secondary market for fixed income in Viet Nam (focusing on government bonds, government-guaranteed bonds and municipal bonds. In September 2009 HNX launched a specialized market to trade in government bonds. Innovations in the new market include a system of Internet-based database that will be updated frequently, as well as quoting of both prices and yields of bond trades.

Hochiminh Stock Exchange (HOSE)

HOSE is a government-owned and -operated exchange under the oversight of the SSC. HOSE serves as the secondary market for fixed income in Viet Nam (focusing on municipal bonds and corporate bonds). In June 2008, all government bonds with maturity dates of at least 6 months in the future were moved from HOSE to HNX.

Vietnam Securities Depository (VSD)

VSD provides depository services and depository memberships to local market participants. According to the *Securities Law*, VSD was established on 27 July 2005 as the sole agent providing support services to complete transactions on the Viet Nam securities market. It commenced operations in May 2006. It is headquartered in Ha Noi, with a branch in Ho Chi Minh City. Both branches serve as depositories for securities traded on the respective exchanges in the two cities. Securities are immobilized at the VSD and participant positions are updated via book entry. On 18 December 2008, VSD was re-organized from a state income-generating service delivery agency into a wholly state-owned company. Under the new structure, the VSD is a limited liabilities company which is 100% owned by the MOF and continues to be responsible for monitoring securities registration, deposit, and settlement. The accounts at the VSD are omnibus accounts under the names of depository members.

Bank for Investment and development of Vietnam (BIDV)

BIDV is the oldest commercial bank in Vietnam. BIDV has been designated as a settlement bank for cash settlement for the cash market. All market members are required to maintain a cash account with the designated clearing bank for cash settlement of trades.

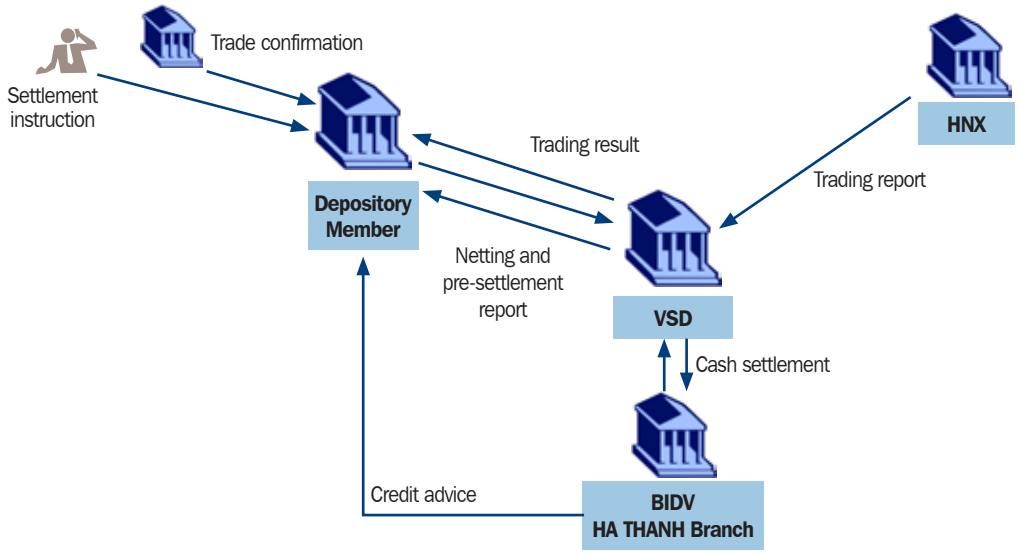
1.3 Trading

The seller and the buyer execute bond trades via direct negotiation methods in the stock exchange market. After trading, participants input manually the trading data into the system of the HNX or HOSE. After trade matching, the system of stock exchanges sends the transaction result to the system of the VSD.

1.4 Central Counterparty Clearing

There is no central counterparty clearing (CCP) on the Vietnam OTC bond market.

Figure 10.1 Bond Settlement Process in the Viet Nam Bond Market



Source: Bank for Investment and Development of Viet Nam.

1.5 Bond Settlement

After receiving transaction results from the exchange markets, VSD performs confirmation between trading parties, netting and conduct settlement processes. Settlement is considered irrevocable after the market deadline, and it becomes obligatory to settle the trades. If the seller or buyer neither affirms nor disputes the trades, it is deemed to have been affirmed by default and such trades are included in its settlement obligations. In fact, VSD sends transaction settlement data to BIDV in the form of files. The software system of VSD and BIDV are independent and do not have a link to each other.

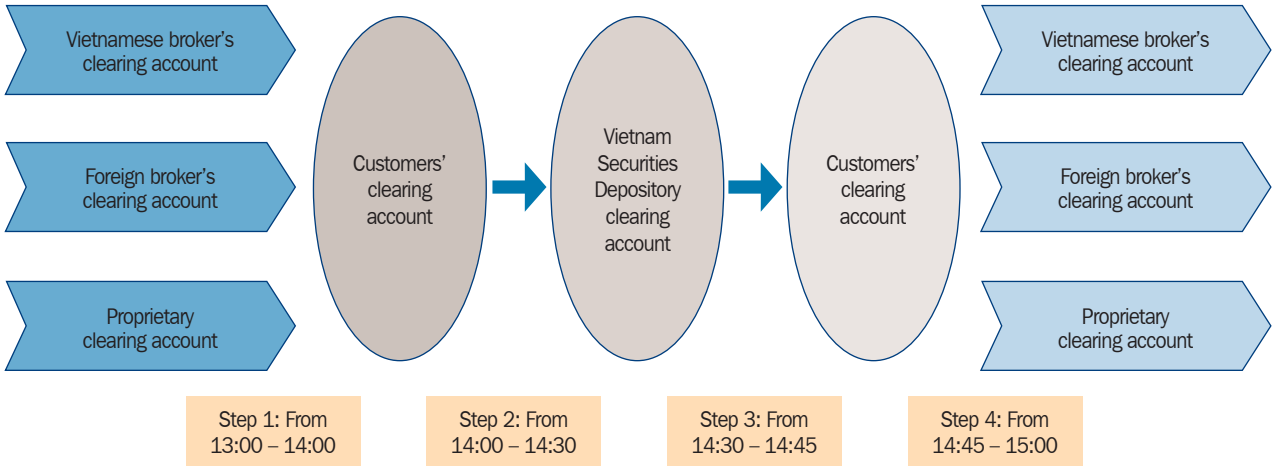
The Bank of International Settlement (BIS) Model 3[12] and Model 1 (for US dollar bonds) are applied in the Viet Nam bond market. Proprietary network without a specific name is used. The types of lines are leased line, Internet Protocol-Virtual Private Network (IP-VPN), and Multi-Protocol Label Switching (MPLS). The protocol is Transmission Control Protocol/Internet Protocol (TCP/IP). The interface to access to the system is terminal while the message format is Extensible Markup Language (XML).

1.6 Cash Settlement

On settlement day, participants must transfer the net cash obligations listed trades to their appropriate cash settlement accounts at BIDV after netting trades for proprietary, domestic clients, and foreign clients. Depository members have to transfer cash to their relevant accounts at BIDV (usually through the interbank system). BIDV will then process this through BIDV's system.

12 Systems that settle transfer instructions for both securities and funds on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.

Figure 10.2 Cash Settlement Process in the Viet Nam Bond Market



Source: Bank for Investment and Development of Viet Nam.

2. Typical Business Flows

2.1 Delivery-versus-Payment Transaction Flow for Domestic Trade on the Over-the-Counter Market

Please refer to Part 3, Figures J.2 and J.3 for the bond transaction flow for domestic trades in the OTC market (DVP).

Traded data are entered to HNX and matched before it is transmitted to VSD.[13] The trades are netted and settled through the accounts in the VSD for bonds and in the BIDV for cash. Therefore, it is not a real-time gross settlement. There are no messages transmitted neither from HNX nor VSD to participants (seller or buyer). Participants need to access from a web terminal or physically to the sites, and obtain information. Therefore, bond settlement infrastructures need to be reconstructed completely to meet ISO 20022. However, considering the current situation of the Viet Nam bond market and trades, it is an appropriate business flow with sufficient functions and robustness. The data are processed in a manner of straight through processing from VSD to BIDV.

2.2 Delivery-versus-Payment Transaction Flow for Cross-border Trade

Please refer to Part 3, Figure J.4 for the bond transaction flow for foreign investors in the OTC Market (DVP).

Cross-border trade transaction flow is in principle not very much different from the generally accepted flow in ASEAN+3 region. Foreign exchange funding to the domestic custodian of buyer needs to be completed before sending trade order. Pre-funding is also required.

[13] Government and corporate bonds are nowadays traded only on HNX; however, some residual bonds (both municipal and corporate) remain on HOSE until maturity.

3. Matching

Matching at HNX is a proprietary matching. The seller and buyer enter traded data into HNX and forward the data to VSD after having been matched. Seller and buyer access the VSD system and check the stored data to be correct. Seller and buyer check the data and change the status of the data in VSD. If both seller and buyer confirm that the traded data are correct, it means bond settlement instructions are matched.

For government bonds traded on the OTC market, since seller or buyer does not send the bond settlement instruction to the VSD, confirmation of traded data stored in VSD to be correct by both seller and buyer is regarded as settlement instructions are matched.

4. Settlement Cycle

The settlement cycle for government bonds is based on the market practice generally accepted in ASEAN+3, which is T+2 or T+3, though it is regarded as T+1 based on local proprietary practice. In other words, the definition of trade date in Viet Nam is different from other ASEAN+3 markets. In Viet Nam, the date of traded data are entered to the HNX is the trade date instead of the date when the bond is actually traded and agreed upon by phone or some other measures. As such the standard settlement cycle in Viet Nam is T+2 or T+3.

5. Numbering and Coding

5.1 Numbering and Coding

5.1.1 Securities Numbering

VSD issues International Securities Identification Number (ISIN) for all bonds registered with VSD and listed in the stock exchanges since VSD is a full member of Association of National Numbering Agencies (ANNA). Local code is used domestically and needs to be converted to ISIN. The market allows investors the option of using ISIN codes and local codes. Local codes are used while ISIN codes are used alternatively subject to specific purposes.

5.1.2 Financial Institution Identification

Local code is used domestically. Conversion between local and Business Identifier Code (BIC) is necessary when foreign institutional investors use the BIC.

5.1.3 Securities Account

Local securities account is used.

5.1.4 Cash Account

Local cash account numbering is used.

5.1.5 Character Code and Language

Unicode (UTF-8) is used. Regarding language, Vietnamese is used as the official language for bond trade and settlement infrastructures.

6. Medium- to Long-Term Strategies

After entering traded data into HNX, the data are processed and transmitted to BIDV for cash settlement through VSD. As such it can be said that straight through processing (STP) is realized fitting the current situation in Viet Nam. However, there are still many paper-based processes between participants (seller and buyer) and infrastructure operators (HNX, VSD, and BIDV), which need to be improved. Therefore, it may be recommended that bond trade- and settlement-related infrastructure will be reconstructed based on international standards in the future.

New information technology-related initiatives to introduce STP (from trade to settlement, including depository) are currently being planned by the stock exchanges and the VSD. New investments to meet technical criteria set up by the stock exchanges and VSD need to be considered.

Part 3

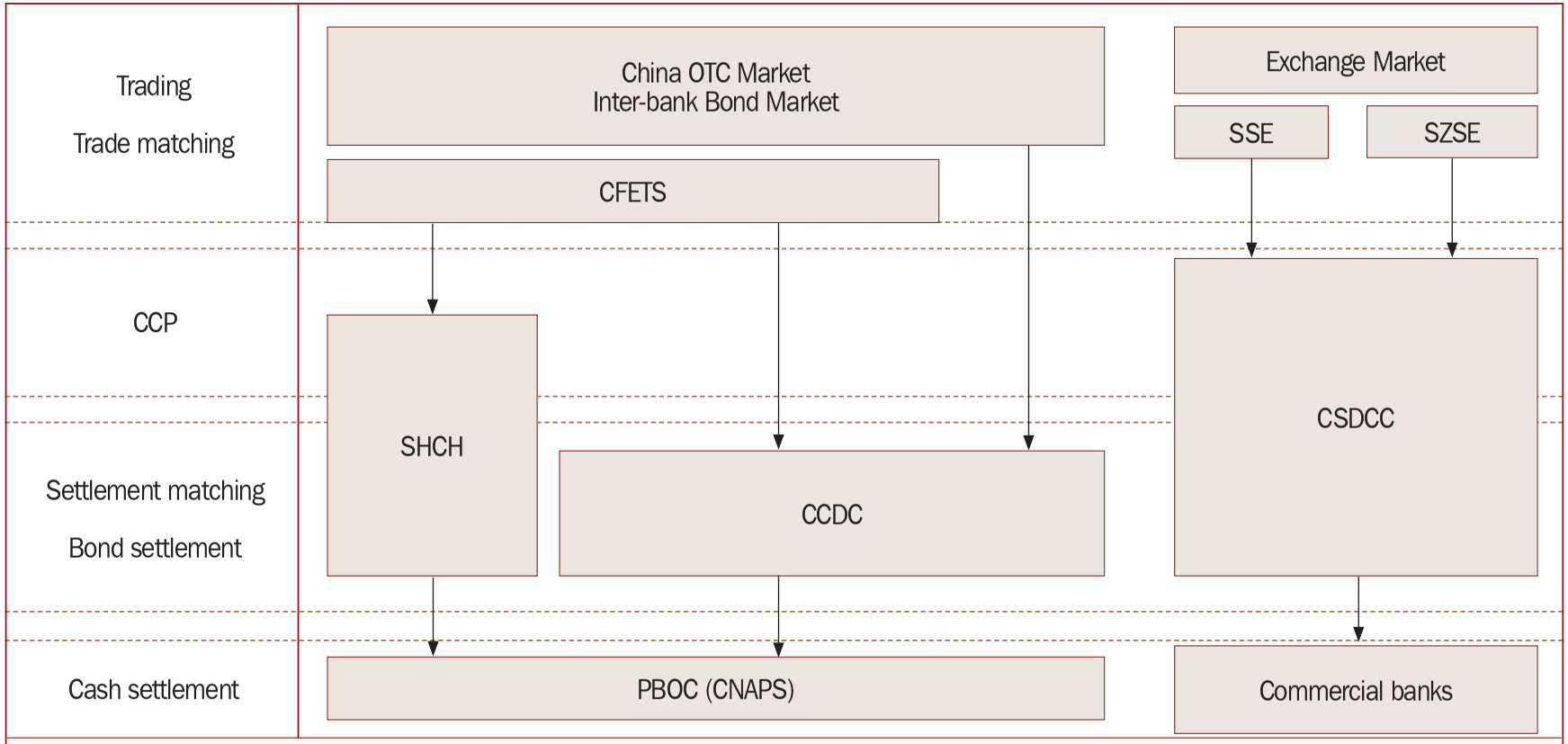
Bond Market Infrastructure Diagrams, Domestic Bond Transaction Flows, and Cross-border Bond Transaction Flows

Contents

People's Republic of China (PRC)

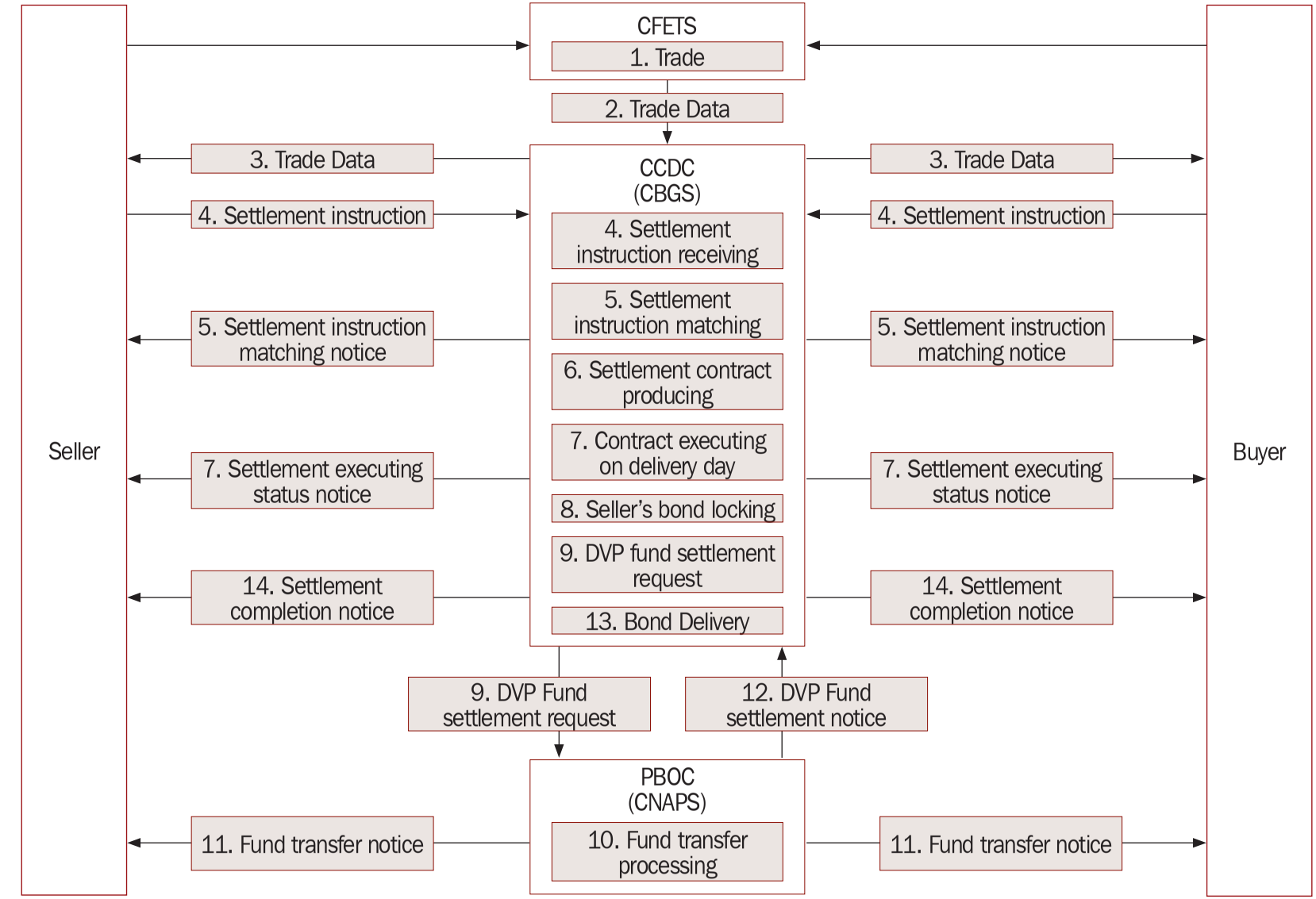
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. PRC Bond Market Infrastructure Diagram



CCDC = China Central Depository and Clearing Corporation; CFETS and NIFC = China Foreign Exchange Trade System and National Interbank Funding Center; CNAPS = China National Automatic Payment System; CSDCC = China Securities Depository and Clearing Corporation; SHCH = Shanghai Clearing House; SSE = Shanghai Stock Exchange; SZSE = Shenzhen Stock Exchange;
Note: Commercial Bank Counter Market is not shown here.
Source: ABMF SF2.

Figure 2. PRC Bond Transaction Flow for Domestic Trades OTC Market/DVP



Source: ABMF SF2.

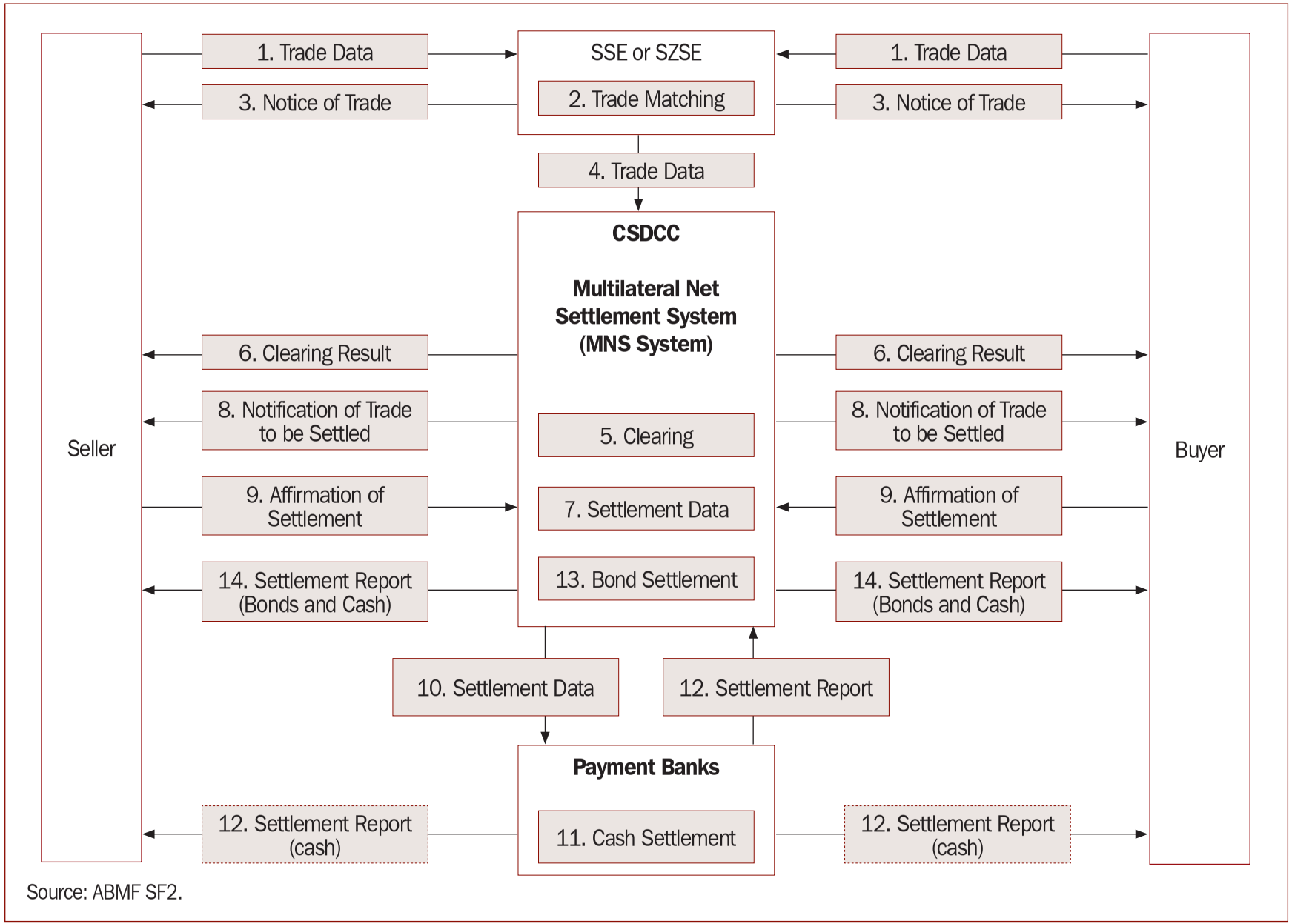
Note: Description of PRC Bond Transaction Flow for Domestic Trades OTC Market/DVP

OTC Market

1. Seller and buyer trade bond via China Foreign Exchange Trade System (CFETS). CFETS provides several trading methods including bilateral negotiation and Click-and-Deal. In China OTC bond market, most of transactions are conducted through the electronic trading platform provided by CFETS, and a small part of the transactions are conducted through telephone or some other ways.
2. CFETS sends trade data to China Central Depository and Clearing (CCDC) or Shanghai Clearing House (SHCH). About 5% of trade data are entered to CCDC directly from seller and buyer (refer to 4. Settlement instruction).
3. CCDC or SHCH sends trade data to seller and buyer for verification.
4. When seller and buyer received trade data from CCDC or SHCH, seller and buyer verify the data. If the data are correct, seller and buyer send affirmative message to CCDC. The messages are regarded as "settlement instructions" to CCDC or SHCH. About 5% of trades are directly entered to CCDC after traded in China OTC Market. In this case, one party (either seller or buyer) needs to send settlement instruction into CCDC system. The settlement instruction needs to contain full message items necessary for the settlement. CCDC system automatically asks the other party to confirm. If not, CCDC does not process settlement. After matching the order (local matching), CCDC settles the trade in FOP or DVP as requested by customers.
5. CCDC or SHCH matches settlement instructions from the seller and buyer and notifies matched result.
6. CCDC or SHCH produces settlement contract.
7. On the settlement day, CCDC or SHCH executes the settlement contract and notifies the status to the seller and buyer.
8. CCDC or SHCH blocks seller's bond to secure DVP transaction.
9. CCDC or SHCH sends DVP fund settlement request to People's Bank of China (PBOC).
10. PBOC executes fund settlement. Fund is transferred from buyer's current account to seller's current account by High Value Payment System (HVPS) of CNAPS.
11. PBOC sends fund transfer notice to the seller and buyer.
12. PBOC sends DVP fund settlement notice to CCDC or SHCH.
13. CCDC or SHCH executes bond delivery (release blocked bond).
14. CCDC or SHCH sends settlement completion notice to the seller and buyer.

Source: ABMF SF2.

Figure 3. PRC Bond Transaction Flow for Domestic Trades Exchange Market/DVP



Source: ABMF SF2.

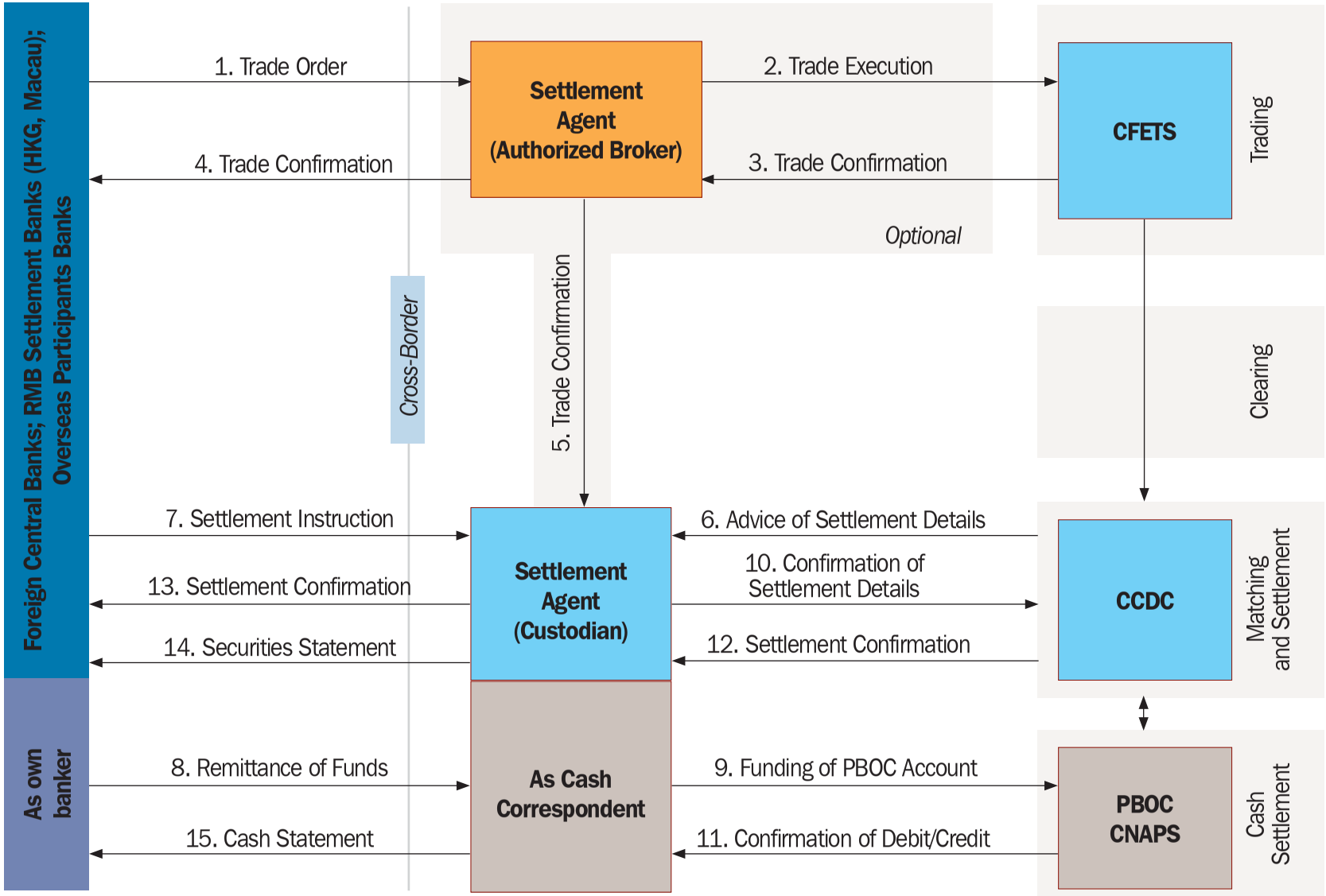
Note: Description of PRC Bond Transaction Flow for Domestic Trades Exchange Market/DVP

Exchange Market

1. The seller and buyer trade via Shanghai Stock Exchange (SSE) or Shenzhen Stock Exchange (SZSE).
2. SSE/SZSE collates orders from the seller and buyer.
3. SSE/SZSE sends notice of trade to the seller and buyer.
4. SSE/SZSE sends trade data to China Central Depository and Clearing Corporation (CSDCC).
5. Clearing function in CSDCC executes clearing process.
6. Clearing function in CSDCC sends clearing result to the seller and buyer.
7. Clearing function in CSDCC sends settlement data to CSD function in CSDCC.
8. CSD function in CSDCC sends notice of trade to be settled to the seller and buyer.
9. The seller and buyer send affirmation of settlement.
10. CSDCC sends settlement data to payment banks.
11. Payment banks perform cash settlement.
12. Payment banks sends settlement reports to CSDCC, seller and buyer.
13. CSD function in CSDCC executes bond settlement.
14. CSDCC sends settlement report (bonds and cash) to the seller and buyer.

Source: ABMF SF2.

Figure 4. PRC Bond Transaction Flow for Foreign Investors OTC Market/RMB Banks



Source: ABMF SF2.

Note: Description of PRC Bond Transaction Flow for Foreign Investors OTC Market/RMB Banks

Trade Date

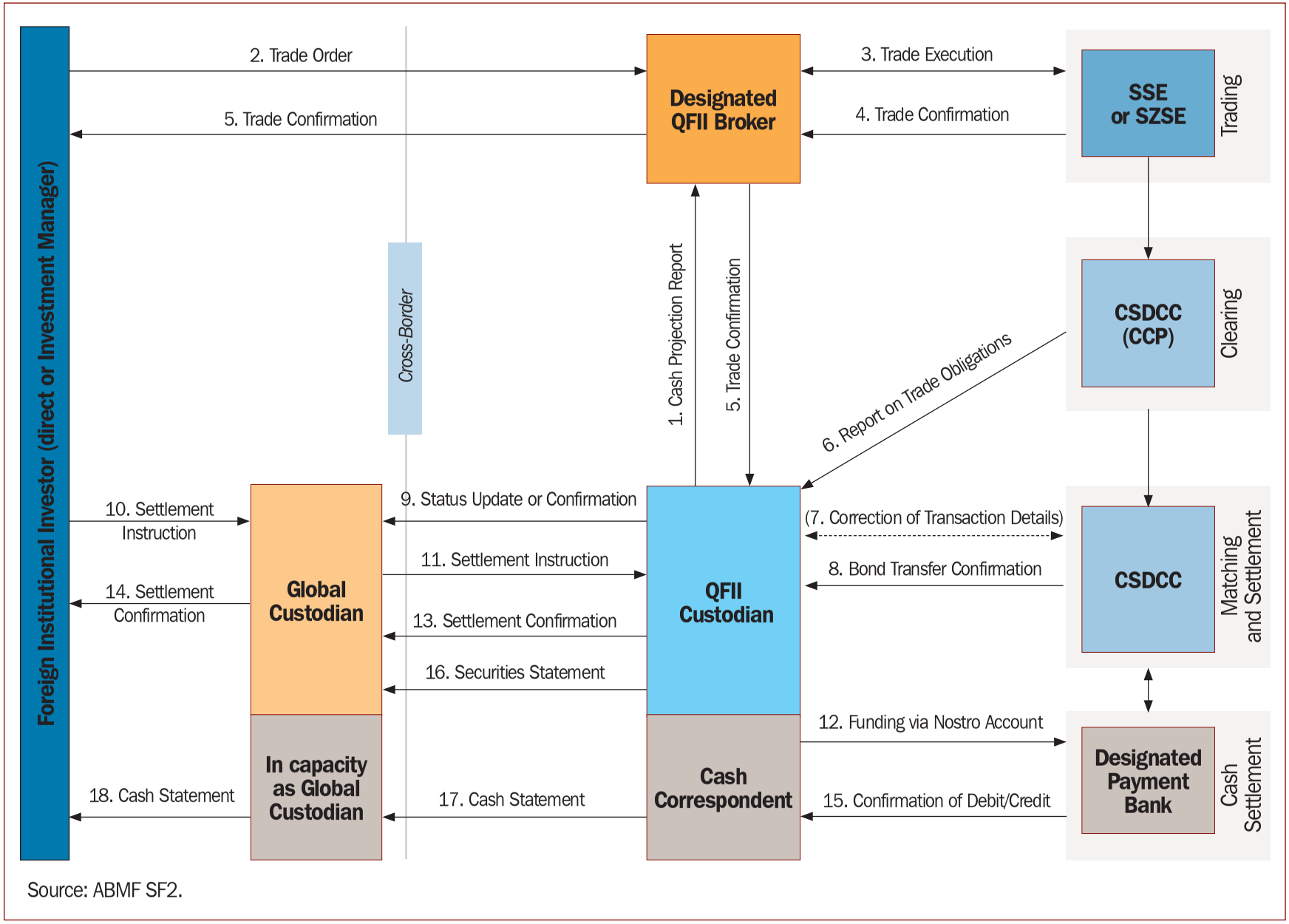
1. Eligible Institution/RMB Bank places order with Settlement Agent (Authorized Broker).
2. Settlement Agent, executes trade on CFETS, then captures trade details in CFETS.
3. Settlement Agent receives trade confirmation from/via CFETS.
4. Settlement Agent sends trade confirmation to Eligible Institution/RMB Bank.
5. Settlement Agent sends trade confirmation to Settlement Agent (custodian).
6. CCDC sends advice of settlement details sent directly from CFETS to Settlement Agent.

Settlement Date (T + 1)

7. Eligible Institution/RMB Bank instructs Settlement Agent on settlement details.
8. Eligible Institution/RMB Bank remits RMB amount to Settlement Agent (custodian).
9. Settlement Agent funds own PBOC account, in preparation for settlement.
10. Settlement Agent confirms/affirms settlement details via CCDC (front-end) system.
11. Upon confirmations from both Settlement Agents, cash settlement is triggered by CCDC and PBOC will send a confirmation of debit or credit to the Settlement Agent.
12. Upon confirmations from both Settlement Agents, securities settlement is effected and CCDC will send a securities settlement confirmation to the Settlement Agent.
13. Settlement Agent sends settlement confirmation to Eligible Institution/RMB Bank.
14. At end of day, Settlement Agent sends securities statement to Eligible Institution/RMB Bank.
15. At end of day, Settlement Agent sends cash movement confirmation/cash statement to Eligible Institution/RMB Bank.

Source: ABMF SF2.

Figure 5. PRC Bond Transaction Flow for Foreign Investors Exchange Market/QFII



Source: ABMF SF2.

Note: Description of PRC Bond Transaction Flow for Foreign Investors Exchange Market/QFII

Trade Date

1. QFII Custodian sends cash projection report to Designated QFII Broker.
2. QFII places order with Designated QFII Broker.
3. Designated QFII Broker checks balance, executes trade on Shanghai Stock Exchange (SSE), or Shenzhen Stock Exchange (SZSE).
4. Designated QFII Broker receives trade confirmation.
5. Designated QFII Broker sends trade confirmation to QFII, and to QFII Custodian.
6. QFII Custodian downloads Report on Trade Obligations from CSDCC (Clearing function).
7. Only in the event of a discrepancy, QFII Custodian needs to contact CSDCC.
8. CSDCC (Settlement function) sends confirmation of transfer of bonds to QFII Custodian (on T evening).
9. QFII Custodian sends status update or partial settlement confirmation to Global Custodian.

Settlement Date

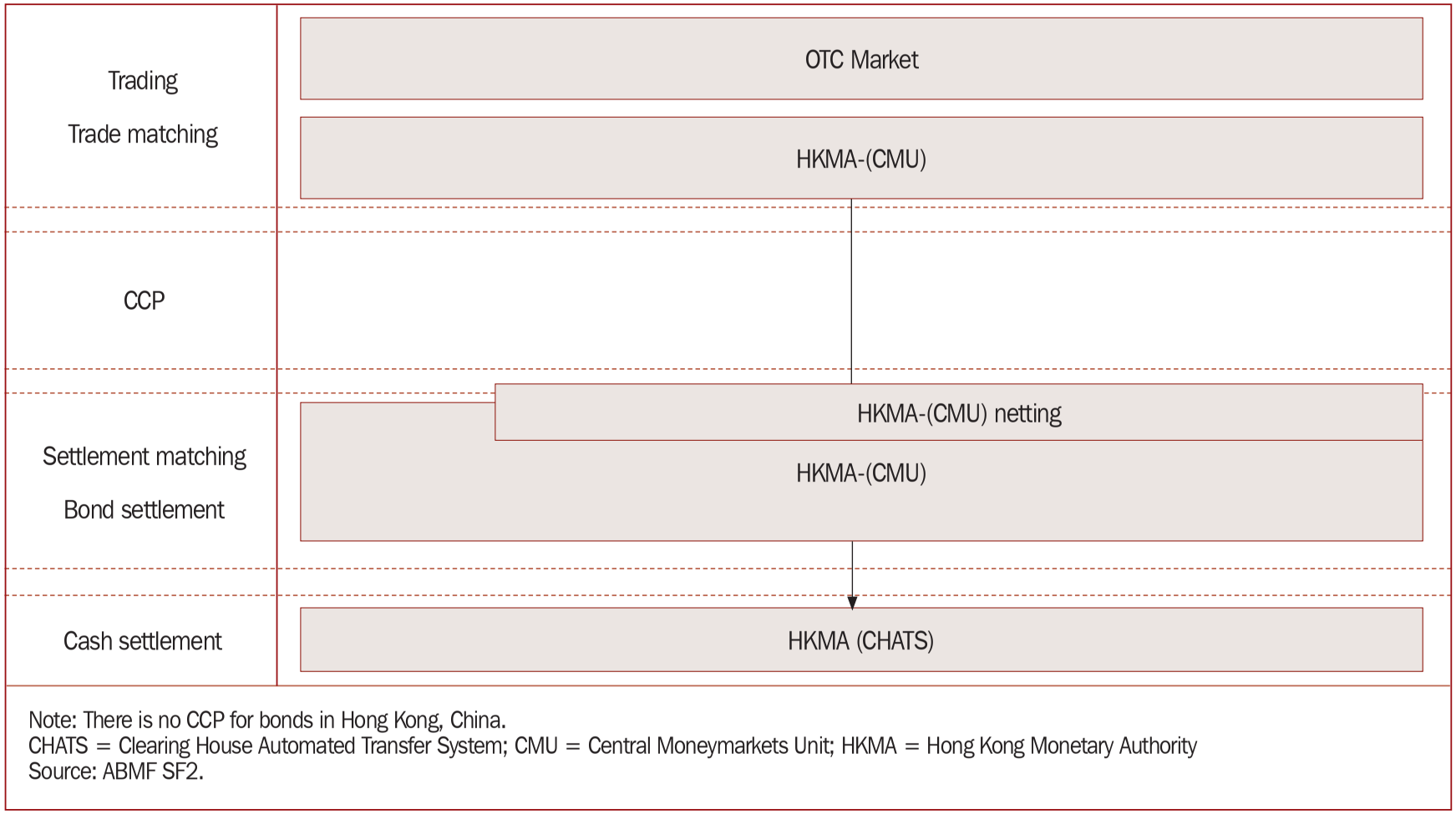
10. QFII instructs Global Custodian on settlement details.
11. Global Custodian instructs QFII Custodian on settlement details.
12. QFII Custodian funds settlement clearing reserve account (CSDCC account at Payment Bank).
13. After cash settlement deadline (in effect completion of trade settlement), QFII Custodian sends settlement confirmation to Global Custodian.
14. Global Custodian sends settlement confirmation to QFII.
15. Payment Bank sends debit/credit information in form of cash statement to QFII Custodian.
16. QFII Custodian sends securities statement to Global Custodian (end of day).
17. QFII Custodian sends cash movement confirmation/cash statement to Global Custodian (end of day).
18. Global Custodian sends cash movement confirmation/cash statement to QFII (end of day).

Source: ABMF SF2.

Hong Kong, China (HKG)

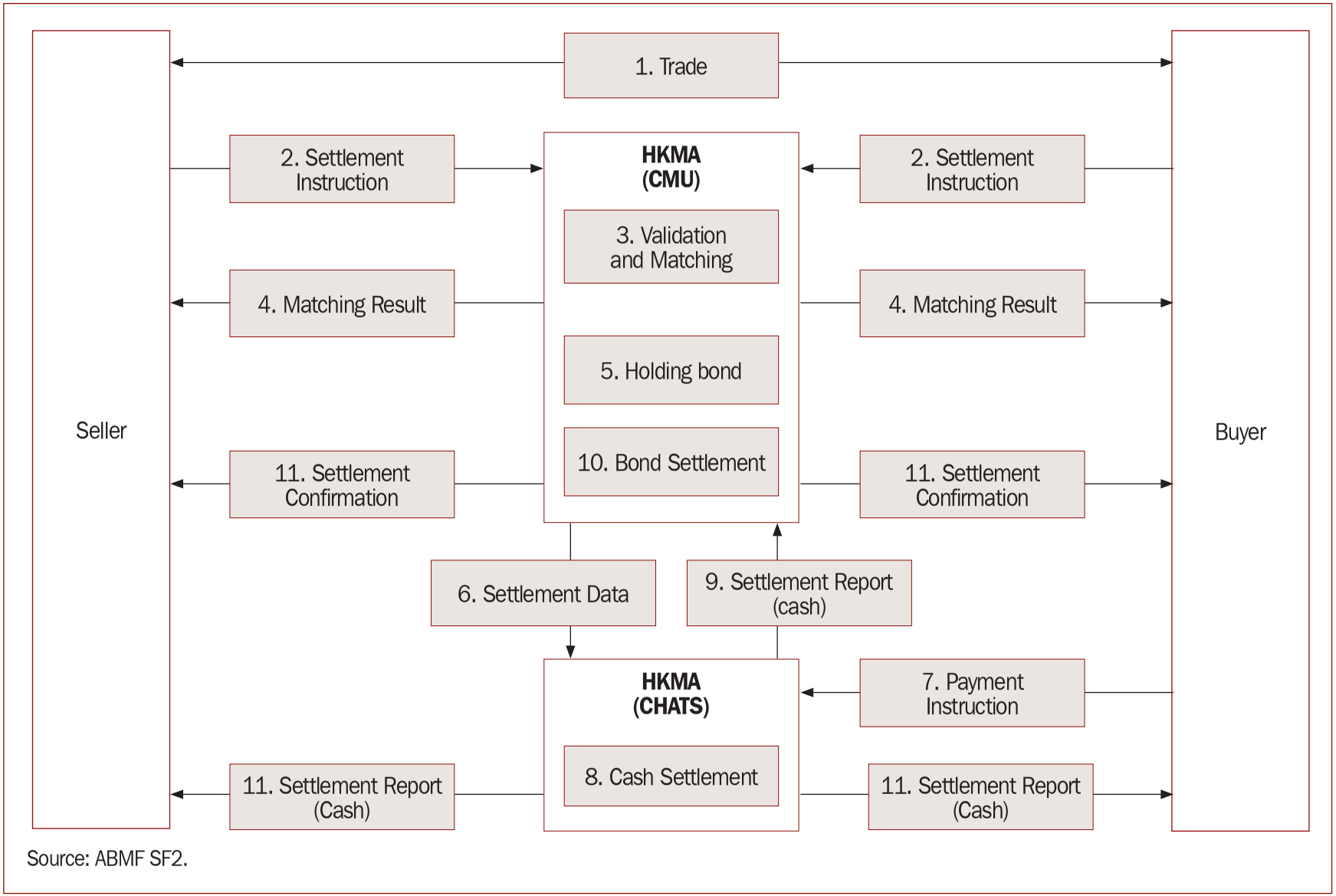
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. HKG Bond Market Infrastructure Diagram



Note: There is no CCP for bonds in Hong Kong, China.
CHATS = Clearing House Automated Transfer System; CMU = Central Moneymarkets Unit; HKMA = Hong Kong Monetary Authority
Source: ABMF SF2.

Figure 2. HKG Bond Transaction Flow for Domestic Trades OTC Market/DVP



Source: ABMF SF2.

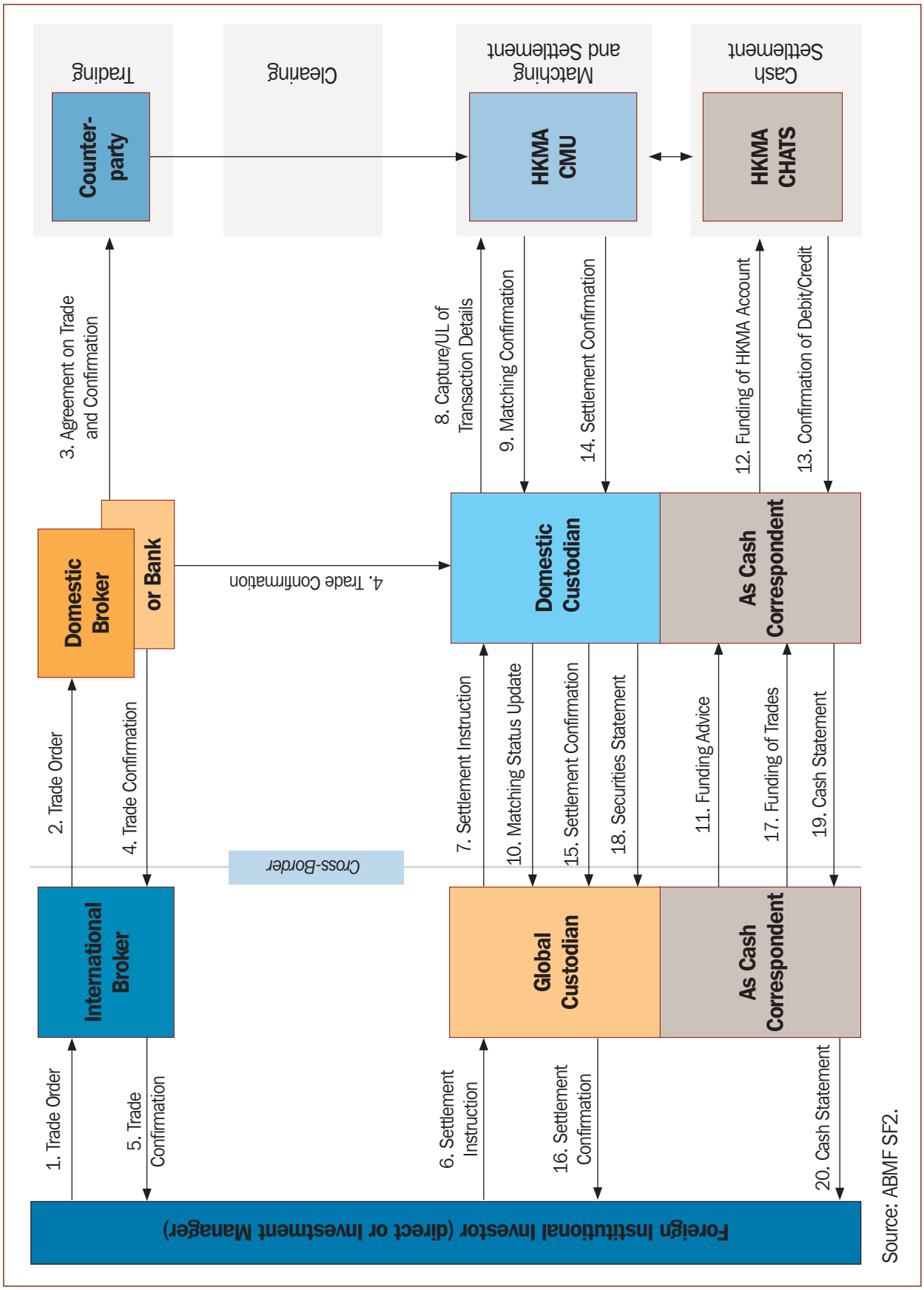
Note: Description of HKG Bond Transaction Flow for Domestic Trades OTC Market/DVP

OTC Market

1. Seller and buyer trade over the counter.
2. The seller and buyer send instructions to Central Moneymarkets Unit (CMU) via CMT, SWIFT, Fax, AFT or by hand. When they use system, either seller or buyer enters trade data to be forwarded to the counterpart (buyer or seller). The counterpart can utilize the trade information as a message instruction to be sent to the CMU. Participants need to send the message instructions before the cutoff time (4:00 p.m.) on settlement day.
3. CMU performs validation and matching.
4. CMU sends matching result to the seller and buyer.
5. CMU holds the bond.
6. CMU sends settlement data to CHATS.
7. For real time DVP settlement involving non-bank debt securities buyer, the buyer instructs its bank to pay by sending payment instruction to CHATS.
8. CHATS executes cash settlement.
9. CHATS sends cash settlement report to CMU.
10. CMU executes bond settlement.
11. CHATS sends cash settlement report to the buyer and seller respectively, while CMU sends securities settlement confirmation to the seller and buyer.

Source: ABMF SF2.

Figure 3. HKG Bond Transaction Flow for Foreign Investors OTC Market/DVP



Source: ABMF SF2.

Note: Description of HKG Bond Transaction Flow for Foreign Investors OTC Market/DVP

Trade Date

1. Foreign Institutional Investor places order with International Broker.
2. International Broker places order with Domestic Broker/Bank.
3. Domestic Broker/Bank trades OTC with Counterparty (via phone or, e.g., Bloomberg).
4. Domestic Broker/Bank sends trade confirmation to International Broker.
5. Foreign Institutional Investor receives trade confirmation.
6. Foreign Institutional Investor instructs Global Custodian, on securities settlement and cash funding details.

T + 1

7. Global Custodian instructs Domestic Custodian on securities settlement.

Settlement Date

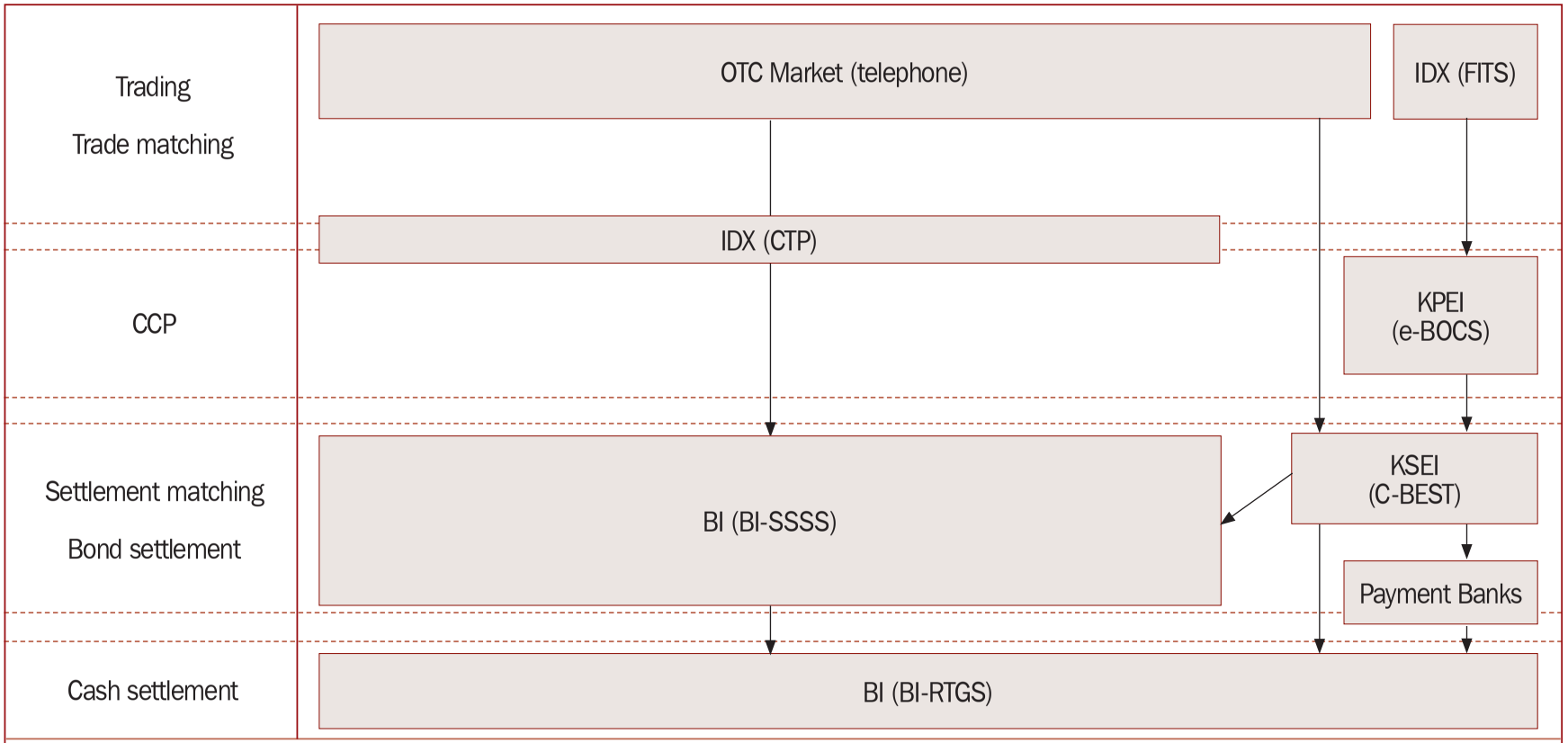
8. Domestic Custodian captures (eCMT or upload) settlement instructions into CMU.
9. Domestic Custodian receives transaction matching confirmation from CMU, or status updates.
10. Domestic Custodian sends matching status update to Global Custodian, either as report or, typically, per individual transaction.
11. Global Custodian advises funding details to Domestic Custodian.
12. Domestic Custodian effects funding of HKMA account via CHATS.
13. Upon transfer of cash, HKMA sends cash settlement confirmation to Domestic Custodian.
14. Upon transfer of bonds, CMU sends bond settlement confirmation to Domestic Custodian.
15. Domestic Custodian sends settlement confirmation to Global Custodian.
16. Foreign Institutional Investor receives settlement confirmation from Global Custodian.
17. Global Custodian funds trades into Domestic Custodian HKD account, or into FCY nostro.
18. Domestic Custodian sends securities statement to Global Custodian (end of day).
19. Domestic Custodian sends debit/credit confirmation as cash statement to Global Custodian (end of day).
20. Global Custodian sends debit/credit confirmation in cash statement to Foreign Institutional Investor (end of day).

Source: ABMF SF2.

Indonesia (INO)

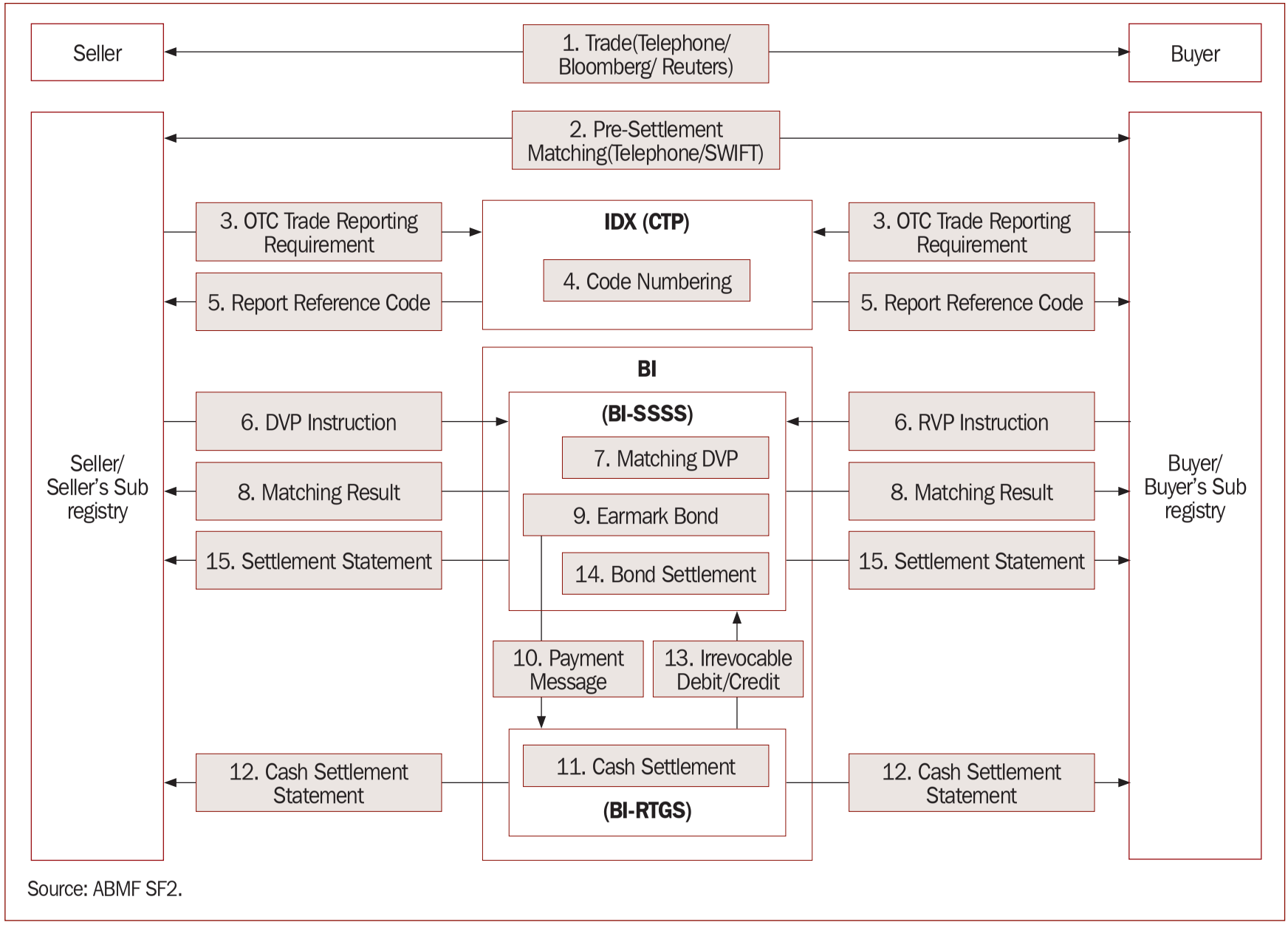
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. INO Bond Market Infrastructure Diagram



BI = Bank Indonesia; BI-SSSS = Bank Indonesia Scripless Securities Settlement System; C-BEST = Central Depository and Book Entry Settlement; CTP = Centralized Trading Platform; e-BOCS = Electronic Bond Clearing System; FITS = Fixed-Income Trading System; IDX = Indonesian Stock Exchange; KPEI = Indonesia Clearing and Guarantee Corporation; KSEI = Indonesian Central Securities Depository
Source: ABMF SF2.

Figure 2. INO Bond Transaction Flow for Domestic Trades OTC Market/DVP



Source: ABMF SF2.

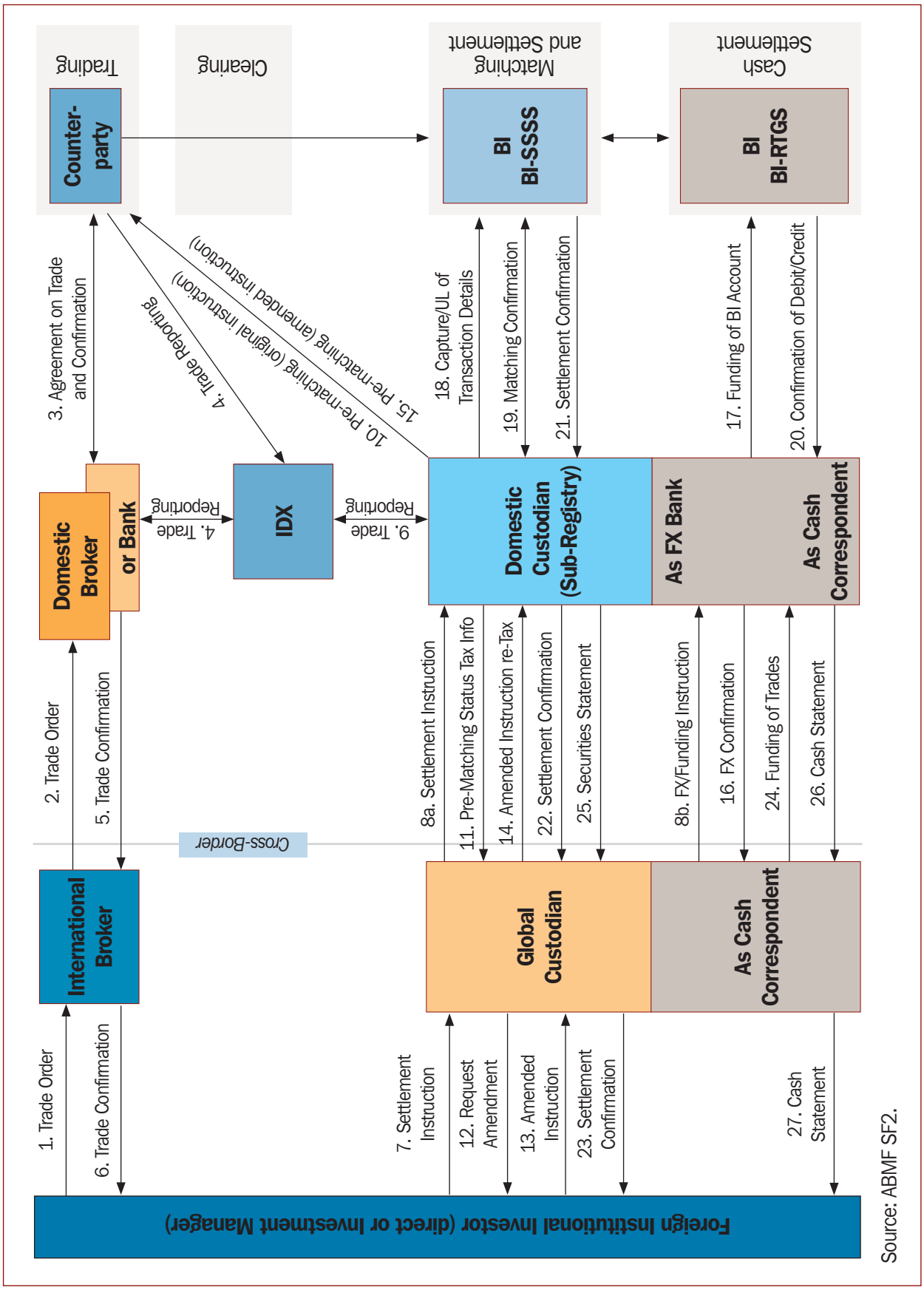
Note: Description of INO Bond Transaction Flow for Domestic Trades OTC Market/DVP

OTC Market

1. The seller and buyer trade government bonds over-the-counter. Most of trades are done by telephones.
2. Both seller and buyer send pre-settlement matching instructions over the SWIFT or pre-match the traded data for settlement over the telephone. Before the pre-settlement matching two components of bond taxes which are capital gains tax (CGT) and interest (withholding) tax need to be calculated. Pre-settlement matching is performed via telephone or swift.
3. The seller or buyer have to report trade data to Centralized Trading Platform (CTP) of Indonesia Stock Exchange (IDX) within 30 minutes of trade.
4. IDX puts the code on each trade.
5. The seller and buyer receive report reference code from IDX.
6. The seller and buyer key in the DVP and RVP instructions to BI-SSSS, respectively.
7. BI-SSSS performs the matching.
8. BI-SSSS reports the matching results to the seller and buyer.
9. Bond is earmarked to secure the DVP.
10. Payment message for DVP is sent to Bank Indonesia Real Time Gross Settlement (BI-RTGS)
11. When the funds are available, the amount is debited from the buyer's cash account and credited to the seller's cash account.
12. BI-RTGS sends the cash settlement statements to the seller and buyer.
13. BI-RTGS notifies the irrevocable debit/credit status to BI-SSSS.
14. BI-SSSS completes bond settlement.
15. BI-SSSS reports the settlement status to both seller and buyer.

Source: ABMF SF2.

Figure 3. INO Bond Transaction Flow for Foreign Trades OTC Market/DVP



Source: ABMF SF2.

Note: Description of INO Bond Transaction Flow for Foreign Trades OTC Market/DVP

Trade Date

1. Foreign Institutional Investor places order with International Broker.
2. International Broker/Domestic Investor places order with Domestic Broker/Bank.
3. Domestic Broker/Bank and Counterparty agree on OTC trade (via e.g. phone or Bloomberg).
4. Domestic Broker/Bank and Counterparty report trade to IDX for price discovery (within 30 minutes of trade).
5. Domestic Broker/Bank sends trade confirmation to International Broker.
6. Foreign Institutional Investor receives trade confirmation.

T + 1

7. Foreign Institutional Investor instructs Global Custodian, on securities settlement and cash/funding details.
8. Global Custodian instructs Domestic Custodian/Sub-Registry on (a) securities settlement details, (b) FX request or funding details.
9. Domestic Custodian/Sub-Registry reports trade details to IDX (within 30 minutes of receipt of instruction), and obtains CTP number.
10. Domestic Custodian/Sub-Registry pre-matches with Counterparty (via phone or email), capital gains tax (CGT) calculated and agreed.
11. Domestic Custodian/Sub-Registry advises Global Custodian on required amendment of settlement amount for CGT.
12. Global Custodian requests Foreign Institutional Investor to amend settlement amount for CGT.

Settlement Date

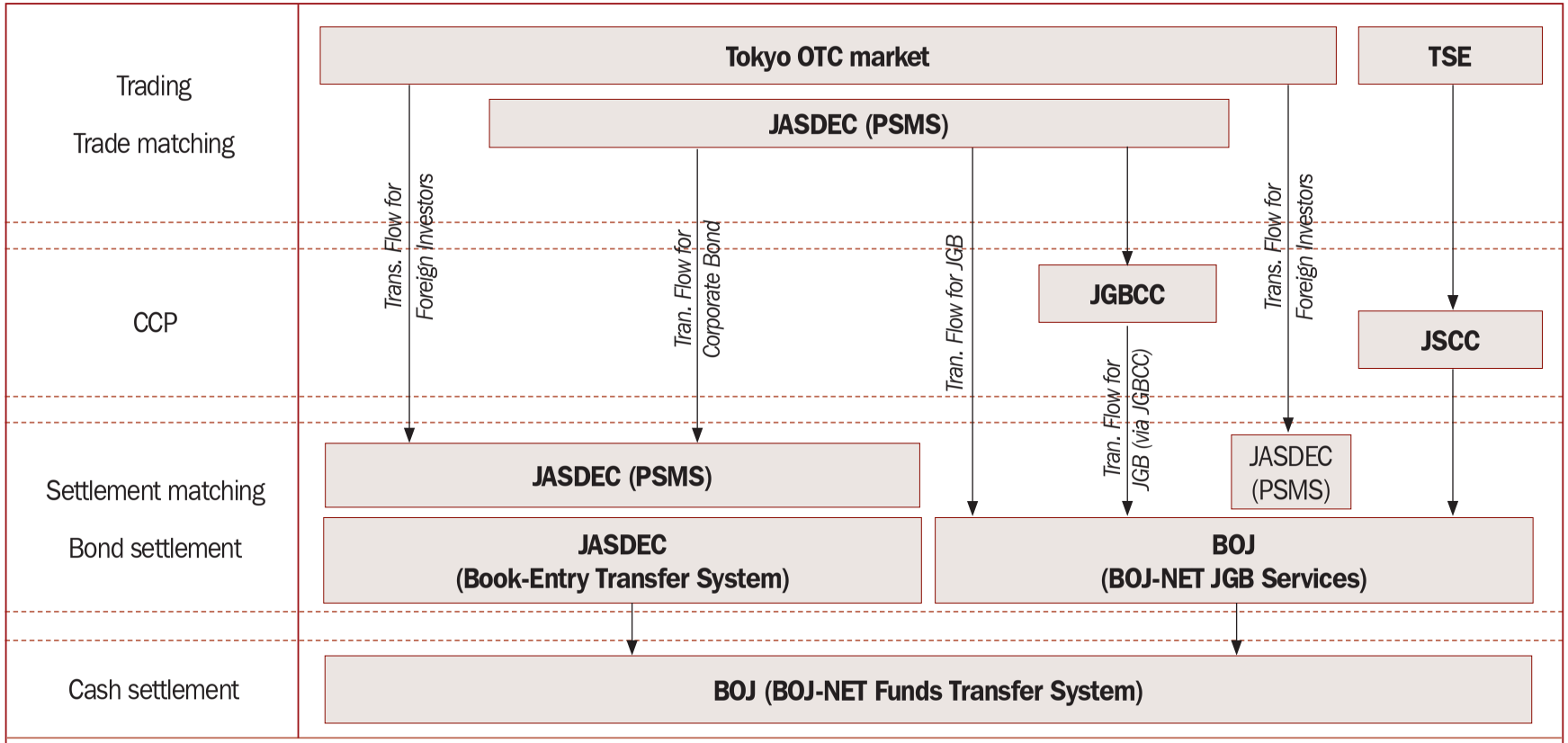
13. Foreign Institutional Investor sends amended settlement instruction to Global Custodian.
14. Global Custodian sends amended settlement instruction to Domestic Custodian/Sub-Registry.
15. Domestic Custodian/Sub-Registry and Counterparty pre-match again on amended settlement amount (via phone or email).
16. Domestic Custodian/Sub-Registry confirms actual FX amount to Global Custodian.
17. Domestic Custodian/Sub-Registry funds its account at BI via RTGS.
18. Domestic Custodian/Sub-Registry enters or uploads trade details into BI-SSSS system.
19. Domestic Custodian/Sub-Registry retrieves BI-SSSS matching status.
20. Upon settling cash, BI-RTGS sends debit/credit confirmation to Domestic Custodian/Sub-Registry.
21. Upon settling securities, BI-SSSS sends settlement confirmation for securities to Domestic Custodian/Sub-Registry.
22. Domestic Custodian/Sub-registry sends settlement confirmation to Global Custodian.
23. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
24. Global Custodian funds account with Domestic Custodian/Sub-Registry.
25. Domestic Custodian/Sub-Registry sends statement of securities to Global Custodian (at end of day).
26. Domestic Custodian/Sub-registry sends debit/credit information in cash statement (at end of day).
27. Global Custodian sends debit/credit information in cash statement (at end of day) to Foreign Institutional Investor.

Source: ABMF SF2.

Japan (JPN)

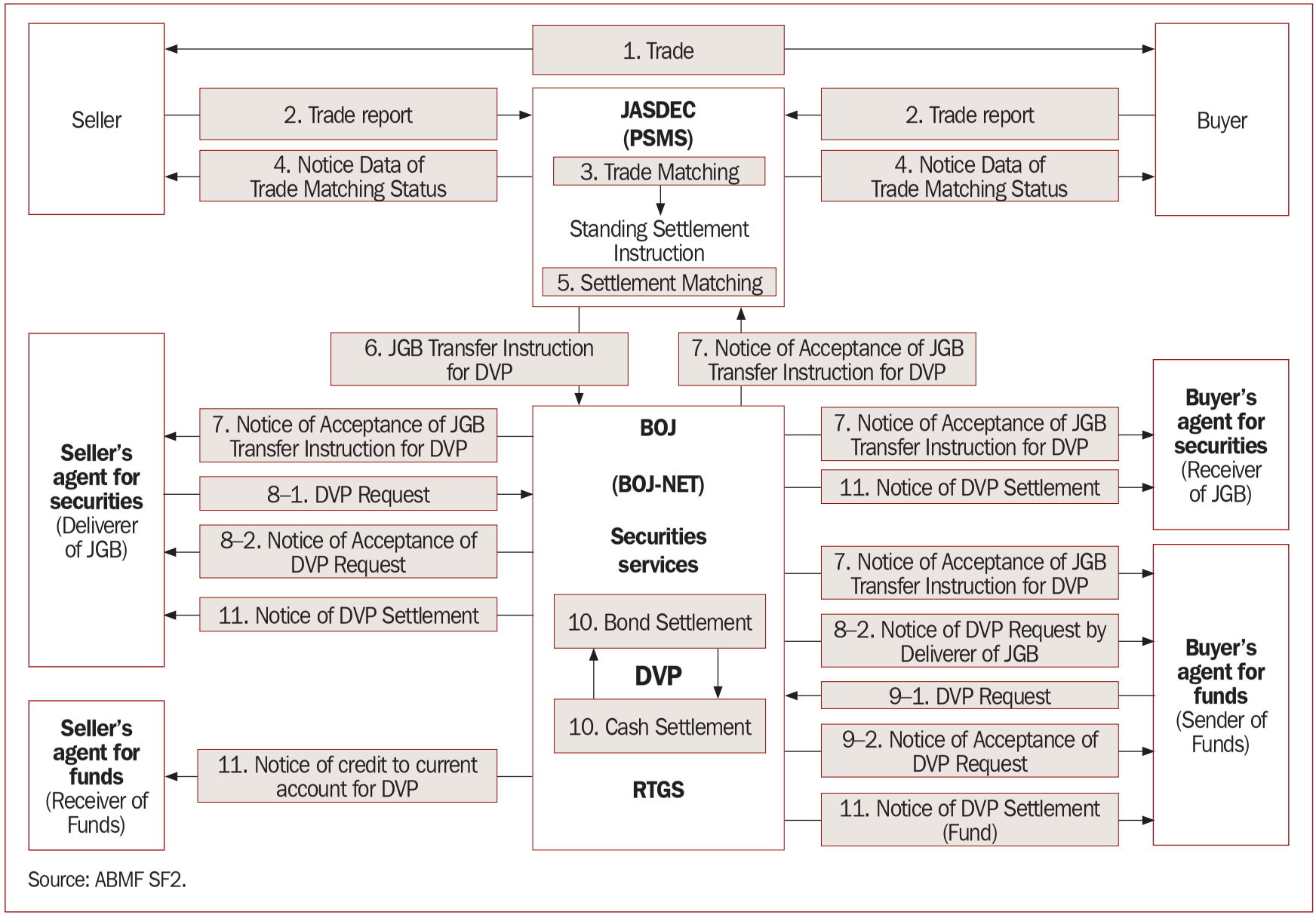
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. JPN Bond Market Infrastructure Diagram



Notes: 1) Current settlement cycle is T+3. In April 2012, settlement cycle will be T+2 (JGB). 2) Non fixed income bonds such as convertible bonds are not included here.
BOJ = Bank of Japan; JASDEC = Japan Securities Depository Center; JGB = Japanese Government Bond; JGBCC = Japanese Government Bond Clearing Corporation; JSCC = Japan Securities Clearing Corporation; OTC = Over the Counter; PSMS = Pre-Settlement Matching System; TSE = Tokyo Stock Exchange
Source: ABMF SF2.

Figure 2. JPN Bond Transaction Flow for Domestic Trades OTC Market (JGB)/DVP through Trade Matching (PSMS)



Source: ABMF SF2.

Note: Description of JPN Bond Transaction Flow for Domestic Trades OTC Market (JGB)/DVP through Trade Matching (PSMS)

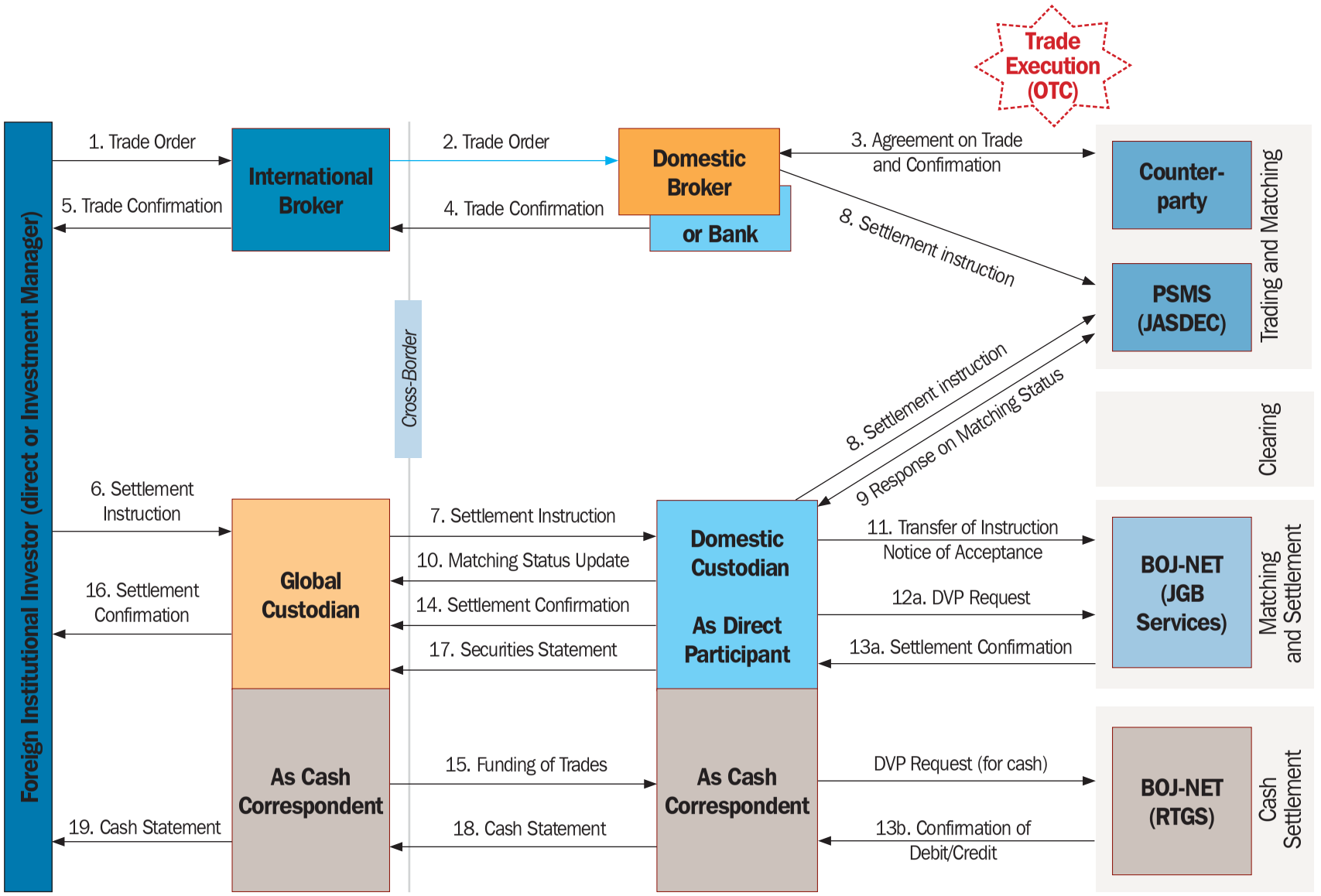
1. The seller and buyer trade government bond over-the-counter.
2. Both seller and buyer send Trade Report data into PSMS (Pre-Settlement Matching System).
3. PSMS performs matching.
4. PSMS sends the Notice Data of Trade Matching Status to both sides of trade.
5. The buyer or the seller sends DVP instruction to BOJ-NET.
6. BOJ-NET sends the Notice of Acceptance of JGB Transfer Instruction for DVP to the seller (or the buyer).

7–1. The seller enters DVP Request to BOJ-NET.
7–2. The buyer enters DVP Request to BOJ-NET (for cash).
8–1. BOJ-NET sends the Notice of Acceptance of DVP Request to seller and completes settlement.
8–2. BOJ-NET sends the Notice of Acceptance of DVP Request to buyer and completes settlement (for cash).

9. BOJ-NET performs security and cash settlement.
10. When DVP settlement completed, BOJ-NET sends the Notice of credit to current account for DVP to the seller and buyer.

Source: ABMF SF2.

Figure 3. JPN Bond Transaction Flow for Foreign Investors OTC Market (JGB)/DVP



Source: ABMF SF2.

Note: Description of JPN Bond Transaction Flow for Foreign Investors OTC Market (JGB)/DVP

T+2 – Trade Date

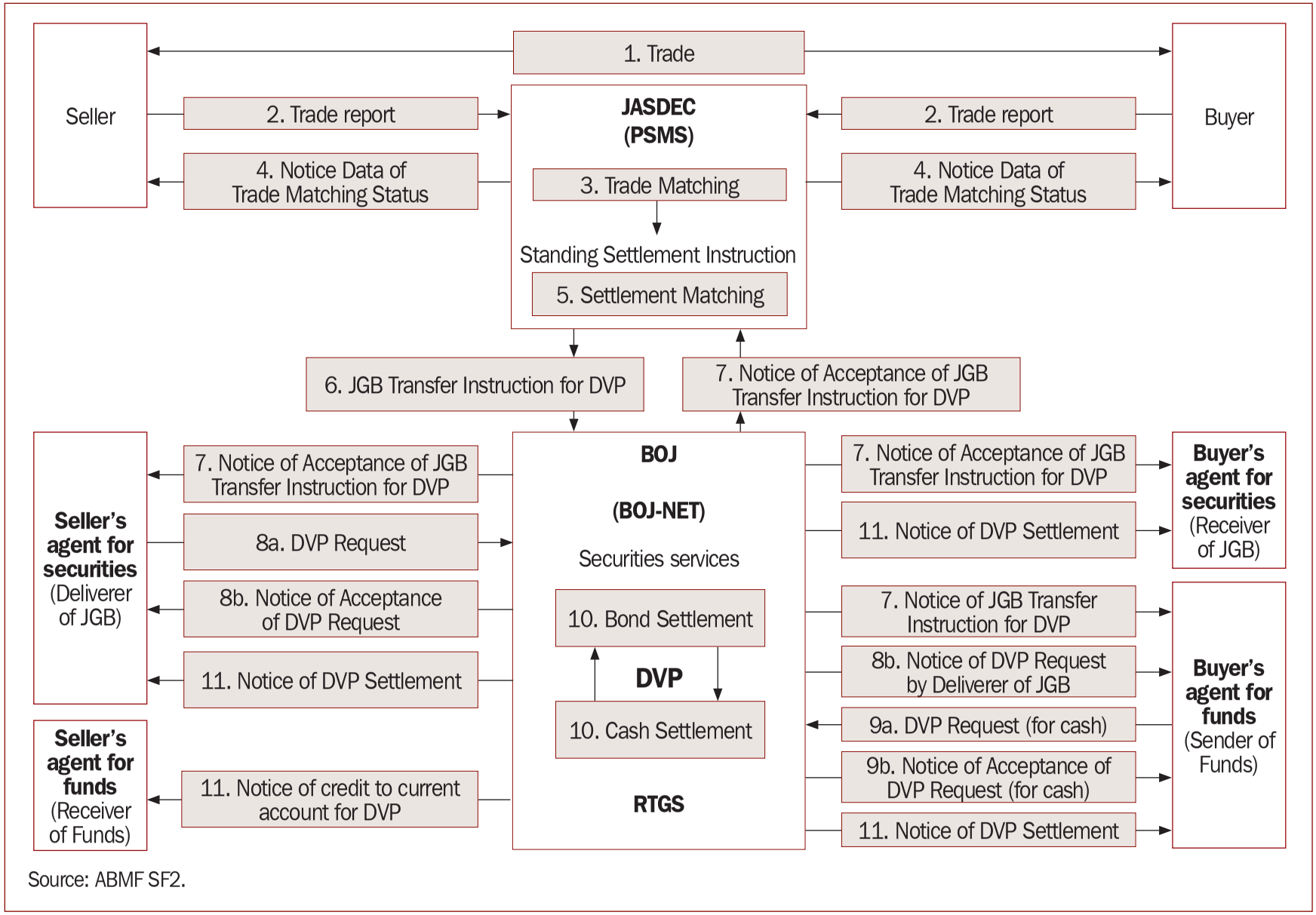
1. Foreign Institutional Investor places order with International Broker.
2. International Broker places order with Domestic Broker/Bank.
3. Domestic Broker/Bank trades OTC with Counterparty (via phone or e.g. Bloomberg).
4. Domestic Broker/Bank send trade confirmation to International Broker.
5. Foreign Institutional Investor receives trade confirmation.
6. Foreign Institutional Investor instructs Global Custodian on securities settlement details.
7. Global Custodian instructs Domestic Custodian on securities settlement details.
8. Domestic Broker and domestic Custodian input trade details into PSMS.
9. PSMS responds with matching status.
10. Domestic Custodian reports transaction status update to Global Custodian.

Settlement Date

11. Domestic Custodian/Direct Participant sends JGB transfer instruction for DVP and receives Notification of Acceptance.
12. Domestic Custodian/Direct Participant send DVP request to BOJ-NET.
13. Domestic Custodian/Direct Participant as receives confirmation of DVP settlement.
14. Domestic Custodian sends settlement confirmation to Global Custodian.
15. Global Custodian funds account with Domestic Custodian, or into FCY nostro (before end of day).
16. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
17. Domestic Custodian sends securities statement to Global Custodian.
18. Domestic Custodian sends cash credit/debit confirmation in cash statement to Global Custodian.
19. Global Custodian sends credit/debit confirmation in cash statement to Foreign Institutional Investor.

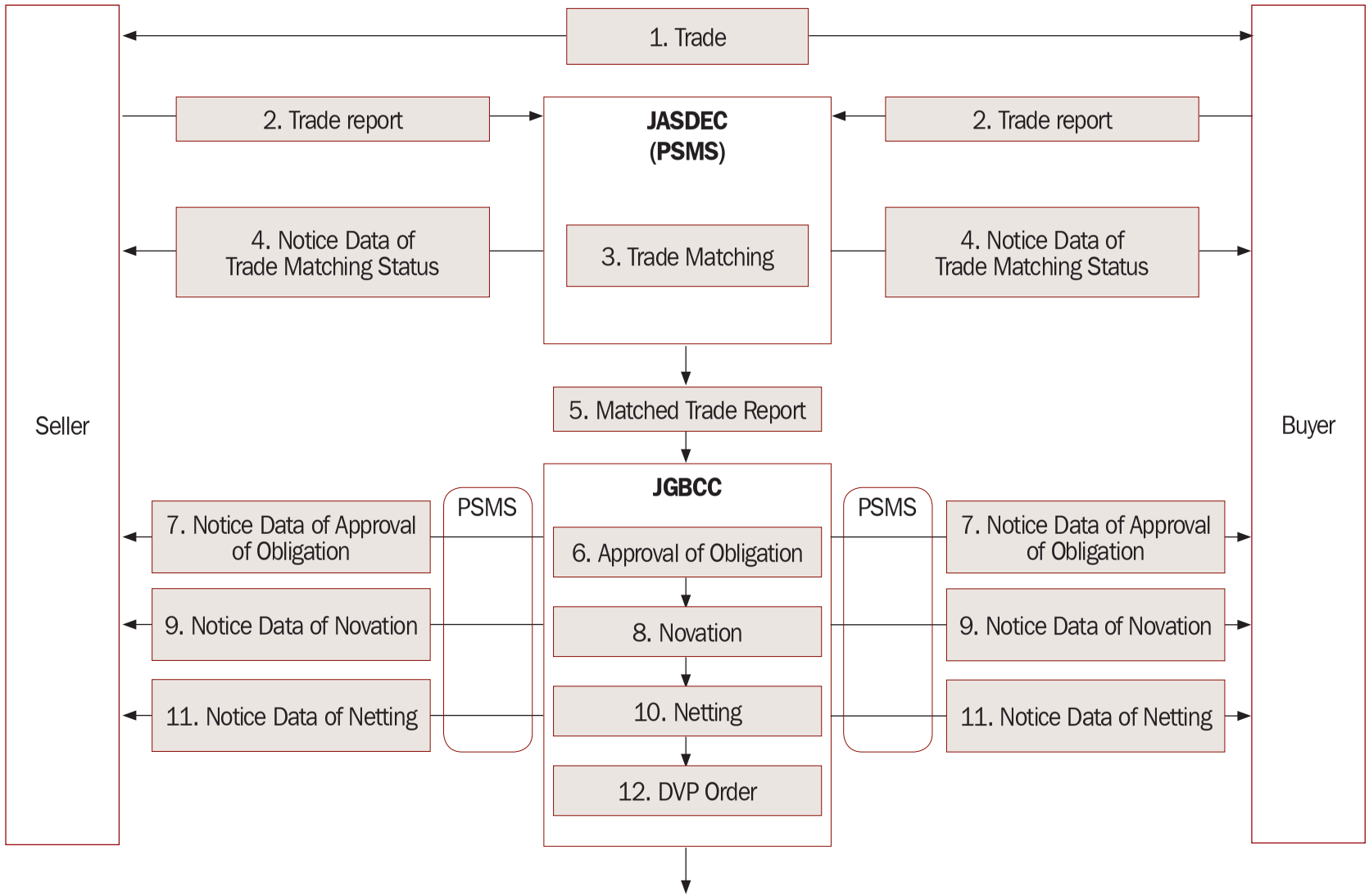
Source: ABMF SF2.

Figure 4. JPN Bond Transaction Flow for Domestic Trades OTC Market (JGB)/DVP (New BOJ-NET) through Trade Matching (PSMS)



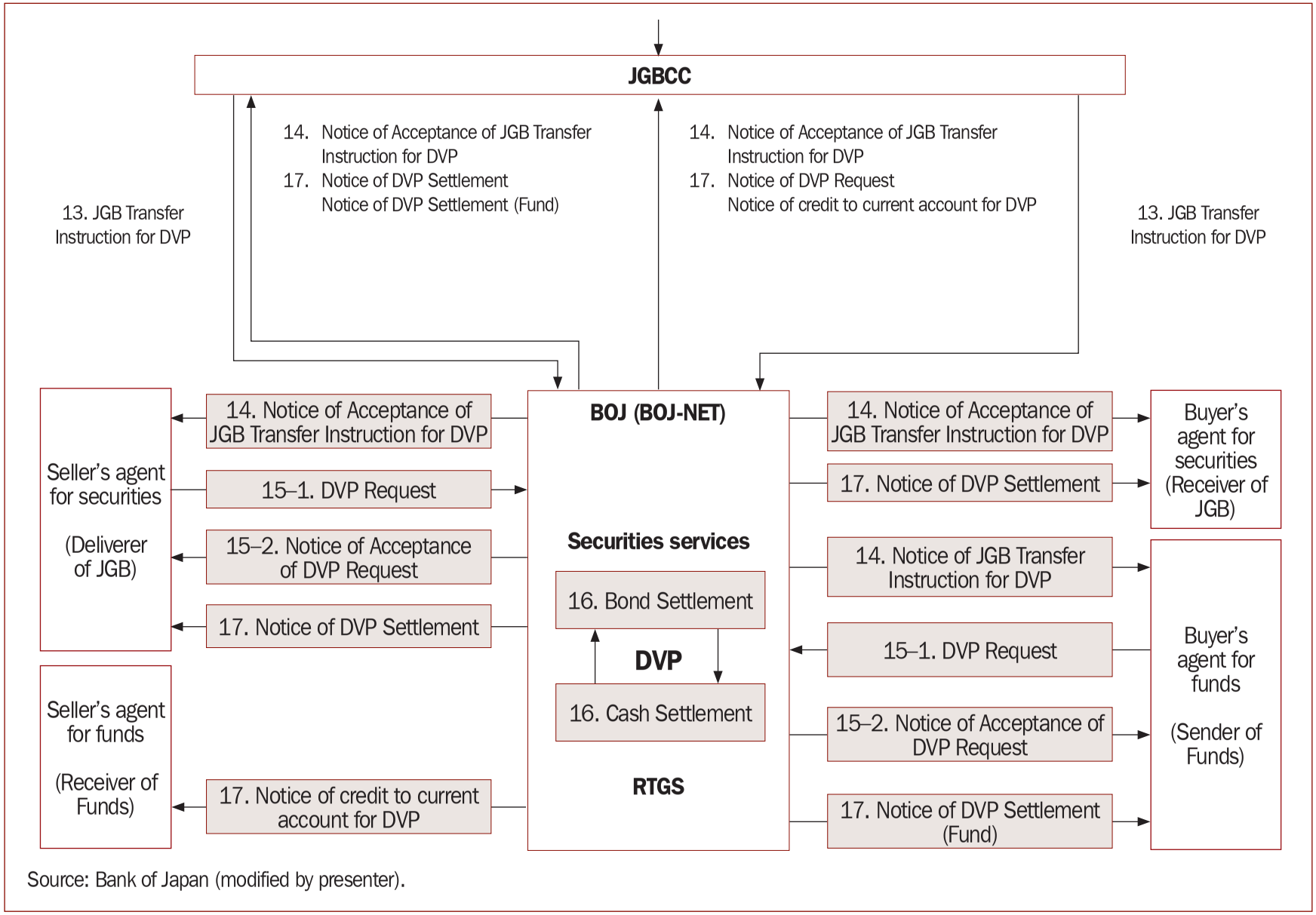
Source: ABMF SF2.

Figure 5. JPN Bond Transaction Flow OTC Market (JGB)/DVP (New BOJ-NET) through Trade Matching (PSMS) and JGBCC (1/2)



Source: Bank of Japan and JASDEC (modified by presenter).

Figure 5. JPN Bond Transaction Flow OTC Market (JGB)/DVP (New BOJ-NET) through Trade Matching (PSMS) and JGBCC (2/2)



Source: Bank of Japan (modified by presenter).

Note: Description of JPN Bond Transaction Flow OTC Market (JGB)/DVP (New BOJ-NET) through Trade Matching (PSMS) and JGBCC

1. The seller and buyer trade government bond over-the-counter.
2. Both seller and buyer key in Trade Report data into PSMS (Pre-Settlement Matching System).
3. PSMS performs trade matching.
4. PSMS sends the Notice Data of Trade Matching Status to both sides of trade.
5. PSMS transmits the message of Matched Trade Report data to JGBCC.
6. JGBCC makes approval of obligation.
7. JGBCC sends the Notice Data of Approval of Obligation to the seller and buyer via PSMS.
8. JGBCC performs the novation.
9. JGBCC sends the Notice Data of Novation to the seller and buyer via PSMS.
10. JGBCC performs the netting.
11. JGBCC sends the Notice Data of Netting to the seller and buyer via PSMS.
12. JGBCC compiles DVP order.
13. JGBCC sends the JGB Transfer Instruction for DVP to BOJ-NET.
14. BOJ-NET sends the Notice of Acceptance of JGB Transfer Instruction for DVP to the seller, the buyer and JGBCC.

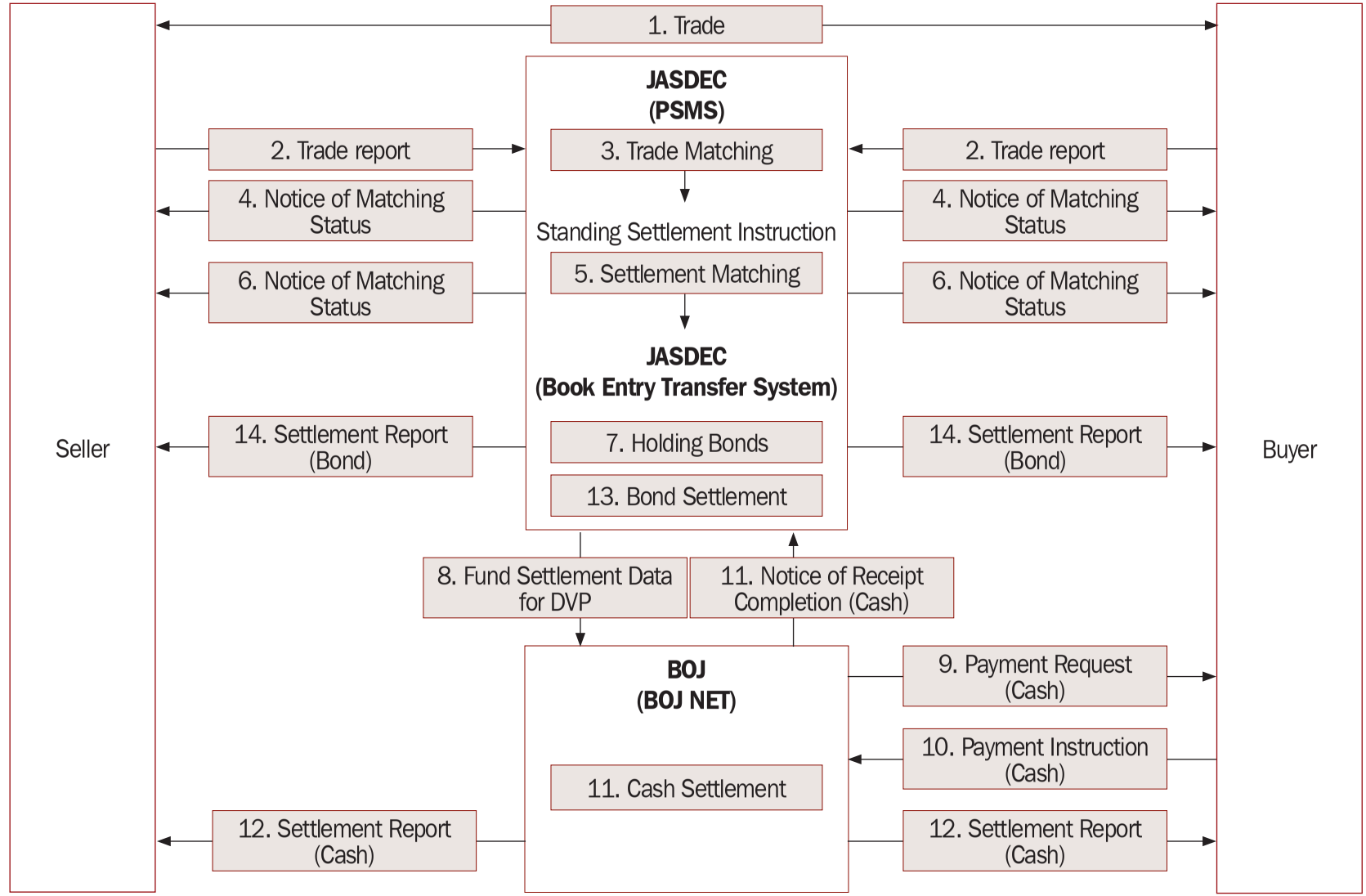
15–1. The seller/the buyer enters DVP Request to BOJ-NET.

15–2. BOJ-NET sends the Notice of Acceptance of DVP Request to the seller / the buyer and completes settlement.

16. BOJ-NET performs security and cash settlement.
17. When DVP settlement completed, BOJ-NET sends the Notice of DVP settlement to the buyer and JGBCC and BOJ-NET sends the Notice of credit to current account for DVP to the seller and JGBCC.

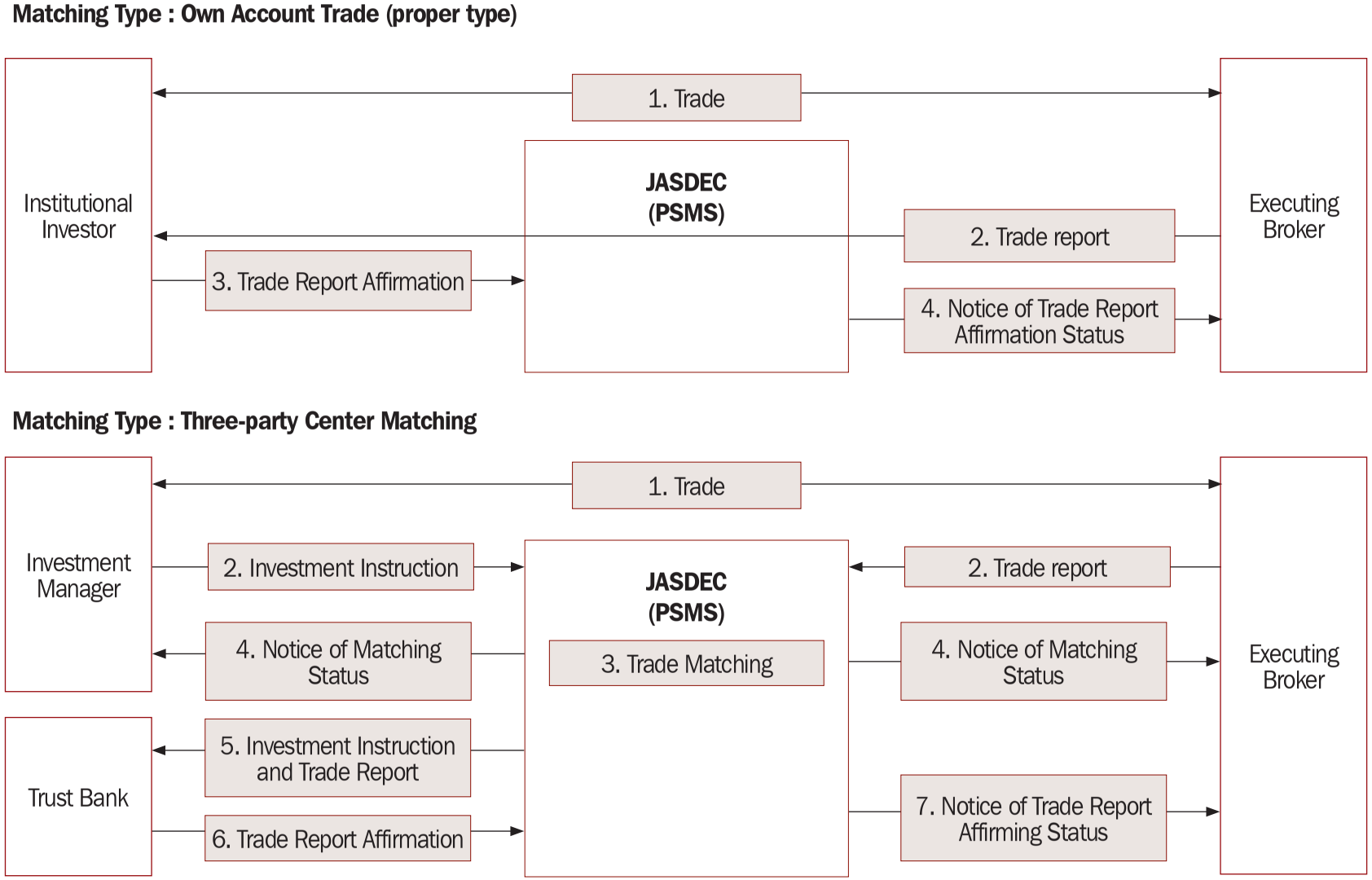
Source: ABMF SF2.

Figure 6. JPN Bond Transaction Flow OTC Market (Corporate Bonds)/DVP (BOJ-NET) through Trade Matching (PSMS)



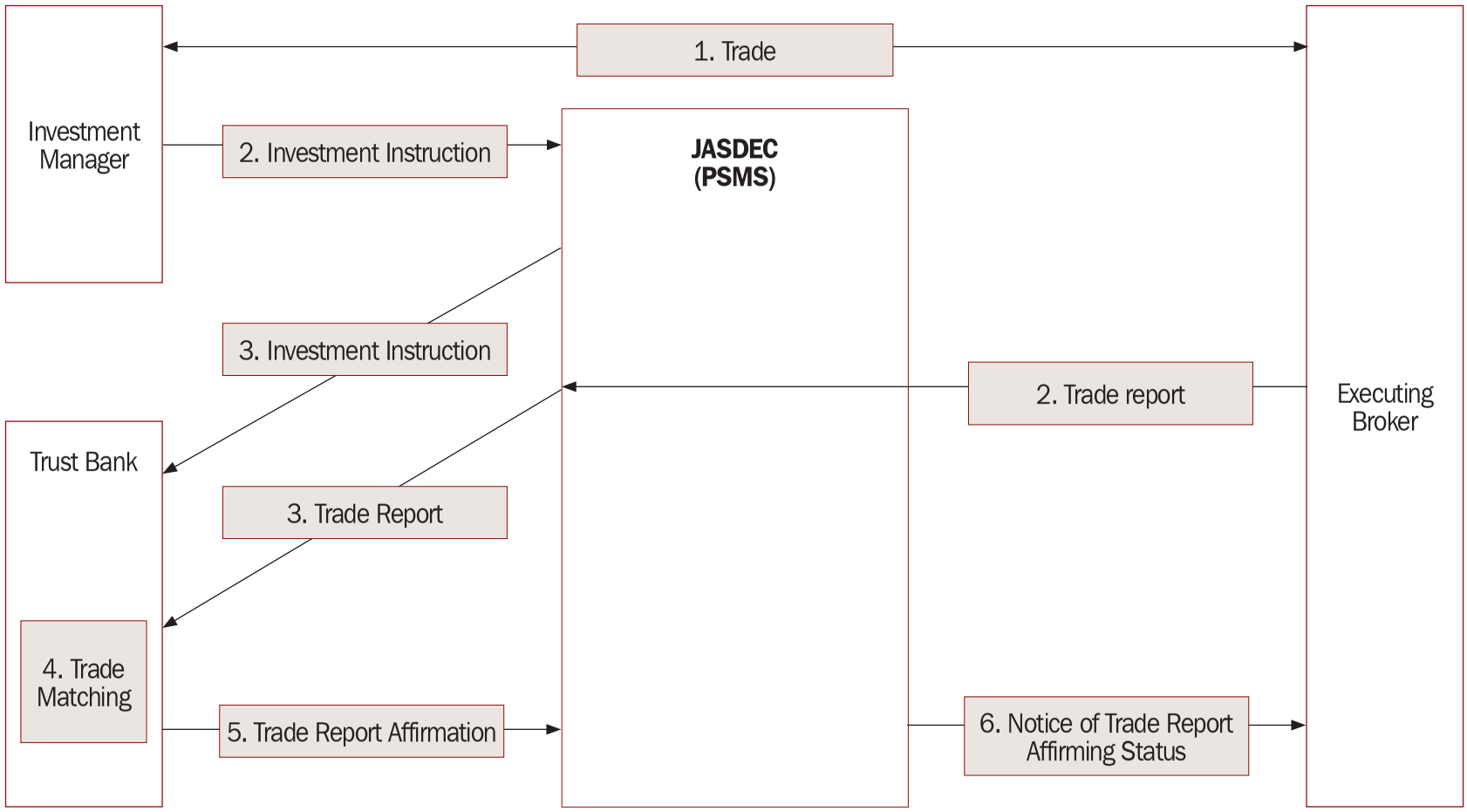
Source: ABMF SF2.

Figure 7. JPN Bond Transaction Flow OTC Market (JGB)/DVP other types of Trade Matching (PSMS) (1/2)



Source: ABMF SF2.

Figure 7. JPN Bond Transaction Flow OTC Market (JGB)/DVP other types of Trade Matching (PSMS) (2/2)

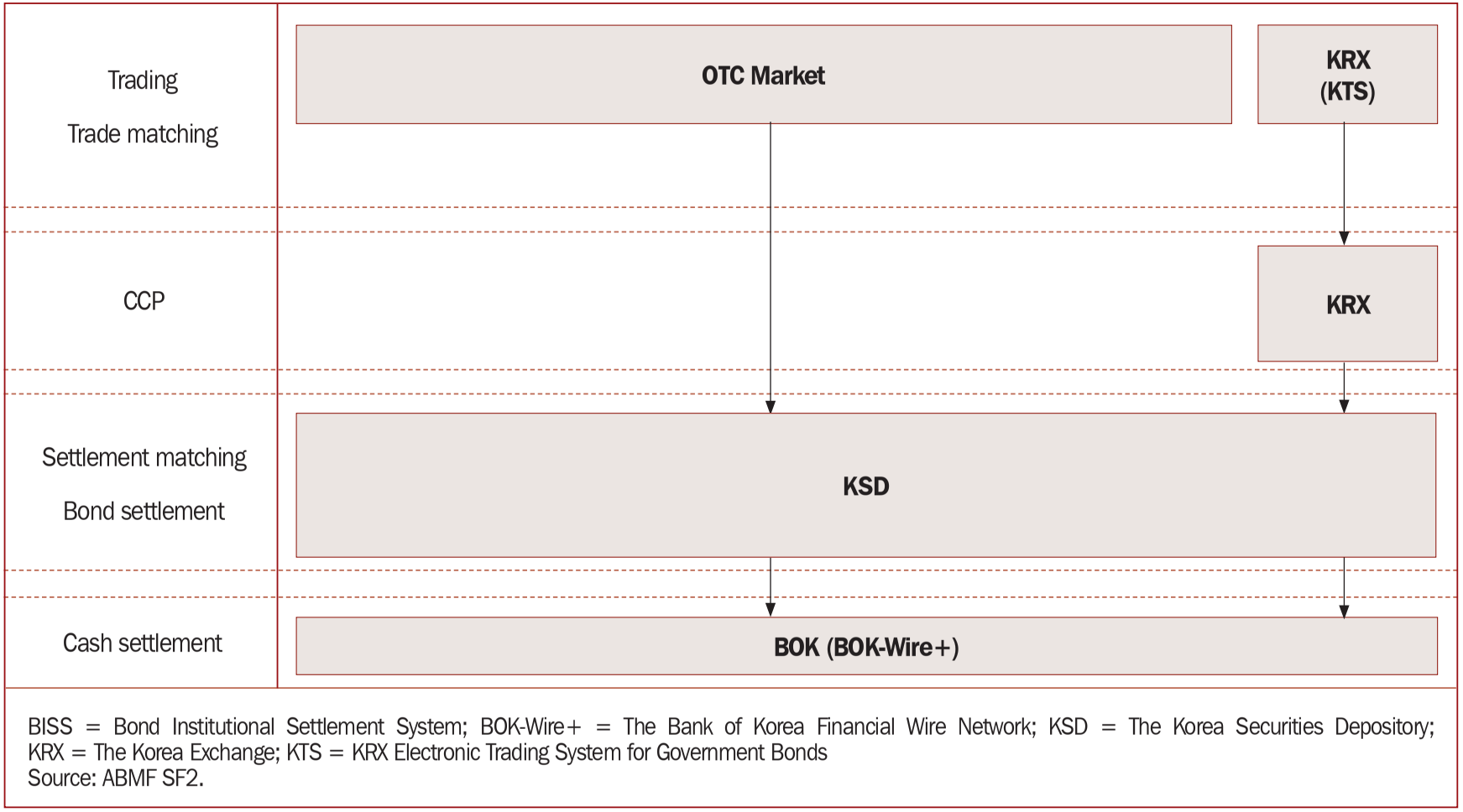


Source: ABMF SF2.

Republic of Korea (KOR)

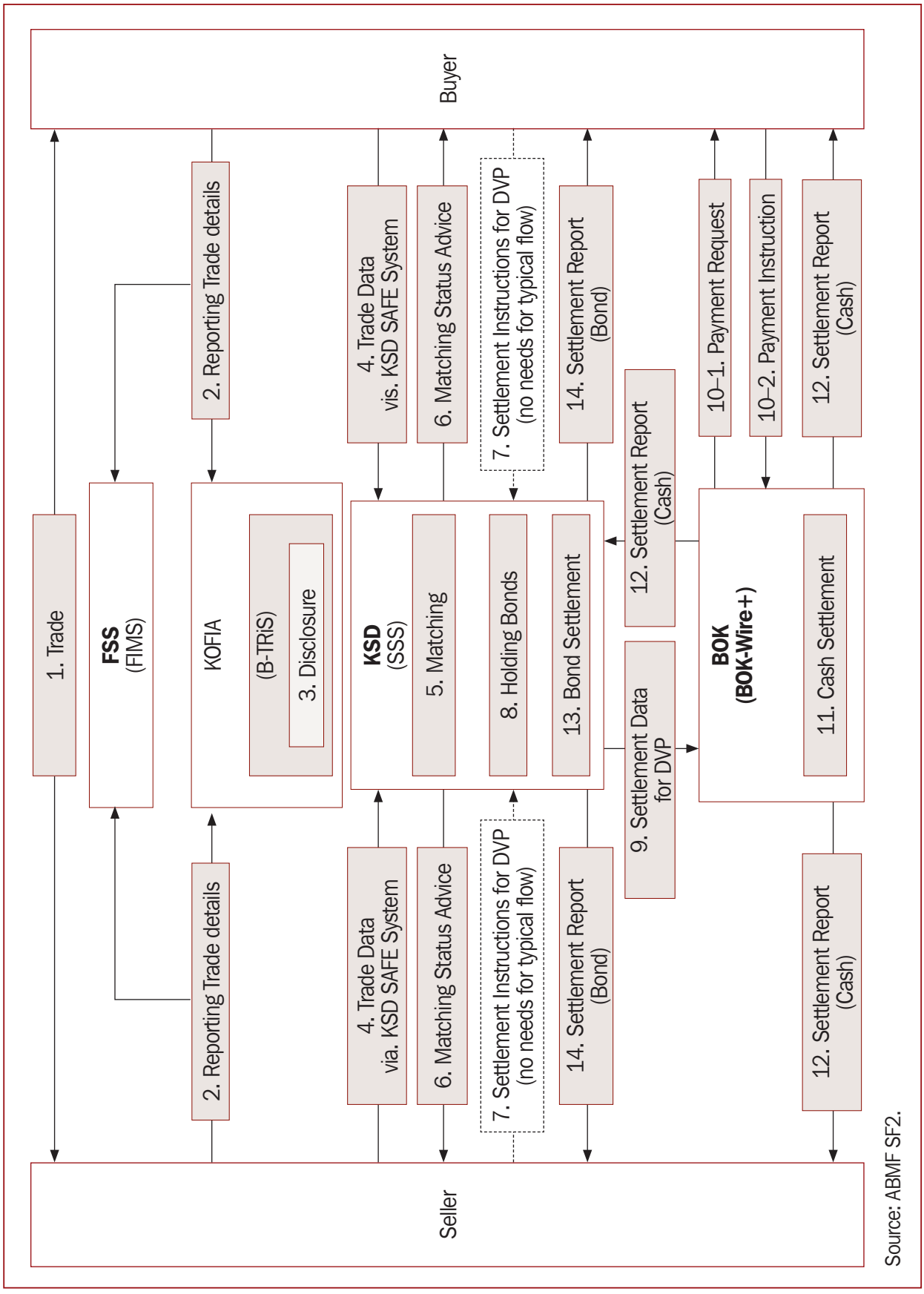
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. KOR Bond Market Infrastructure Diagram



BISS = Bond Institutional Settlement System; BOK-Wire+ = The Bank of Korea Financial Wire Network; KSD = The Korea Securities Depository; KRX = The Korea Exchange; KTS = KRX Electronic Trading System for Government Bonds
Source: ABMF SF2.

Figure 2. KOR Bond Transaction Flow for Domestic Trades OTC Market/DVP



Source: ABMF SF2.

Note: Description of KOR Bond Transaction Flow for Domestic Trades OTC Market/DVP

1. The seller and buyer trade over the counter mostly with private messenger, and some transactions are done with FreeBond provided by KOFIA which is a supporting and confirmation system for bond trading.
2. Financial investment companies engaged in trading must report trading details to the KOFIA within 15 minutes after trading execution. They also report trading details to FSS via Foreign Investment Management System (FIMS).
3. KOFIA discloses this information on its Bond-Trade Report and Information Service (B-TRis).
4. The seller and buyer send trade data to Korea Securities Depository (KSD).
5. KSD collates trade data from the seller and buyer.
6. KSD sends matching status advise to the seller and buyer.
7. The seller and buyer send settlement instructions for DVP to KSD.
8. KSD holds bonds before cash settlement.
9. KSD sends settlement data to Bank of Korea (BOK).

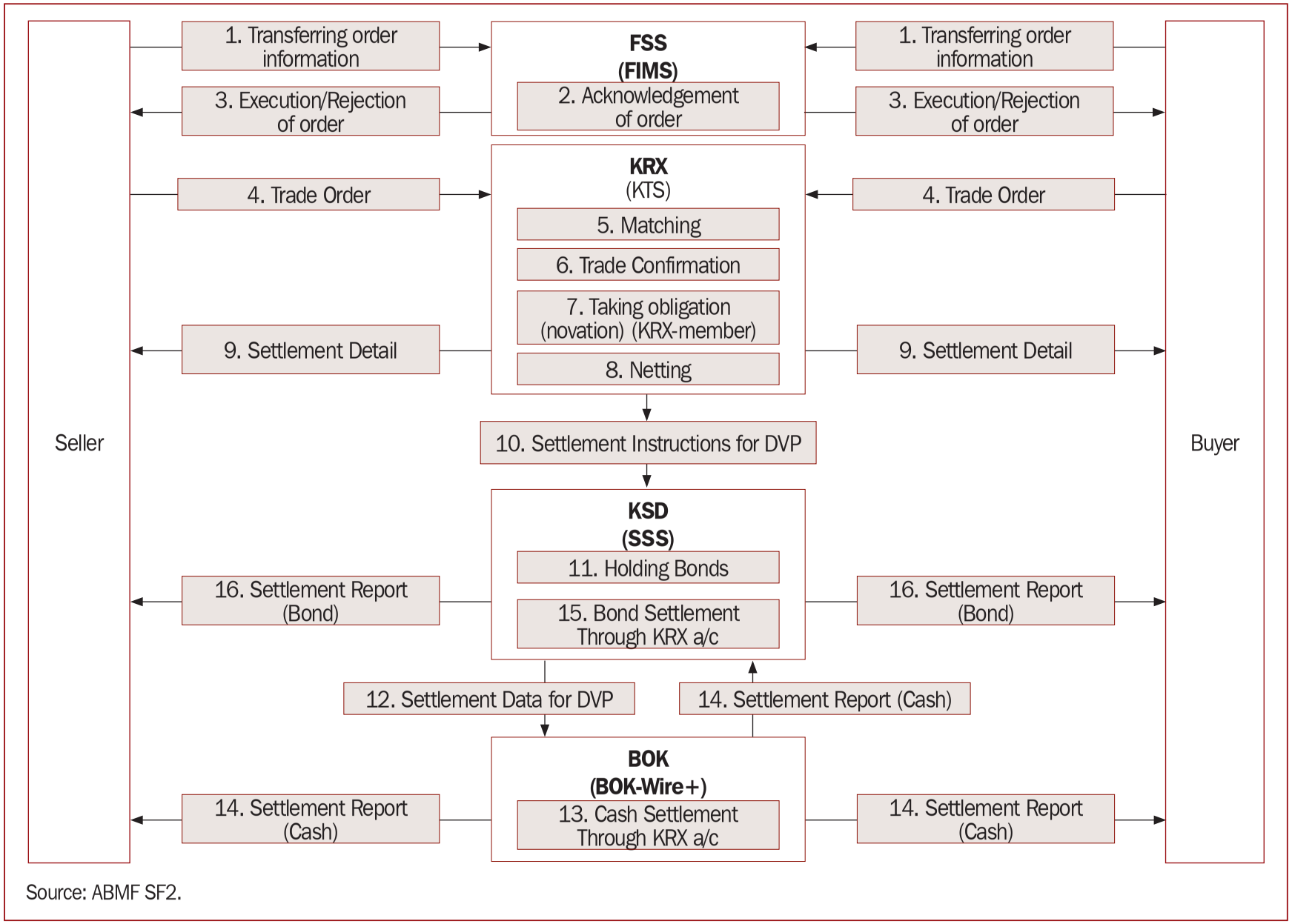
10–1. The BOK sends payment request (cash) to the buyer.

10–2. The buyer sends the payment instruction for DVP to the BOK.

11. BOK executes cash settlement.
12. BOK sends settlement report to the KSD.
13. KSD executes bond settlement.
14. KSD sends settlement report to the seller and buyer.

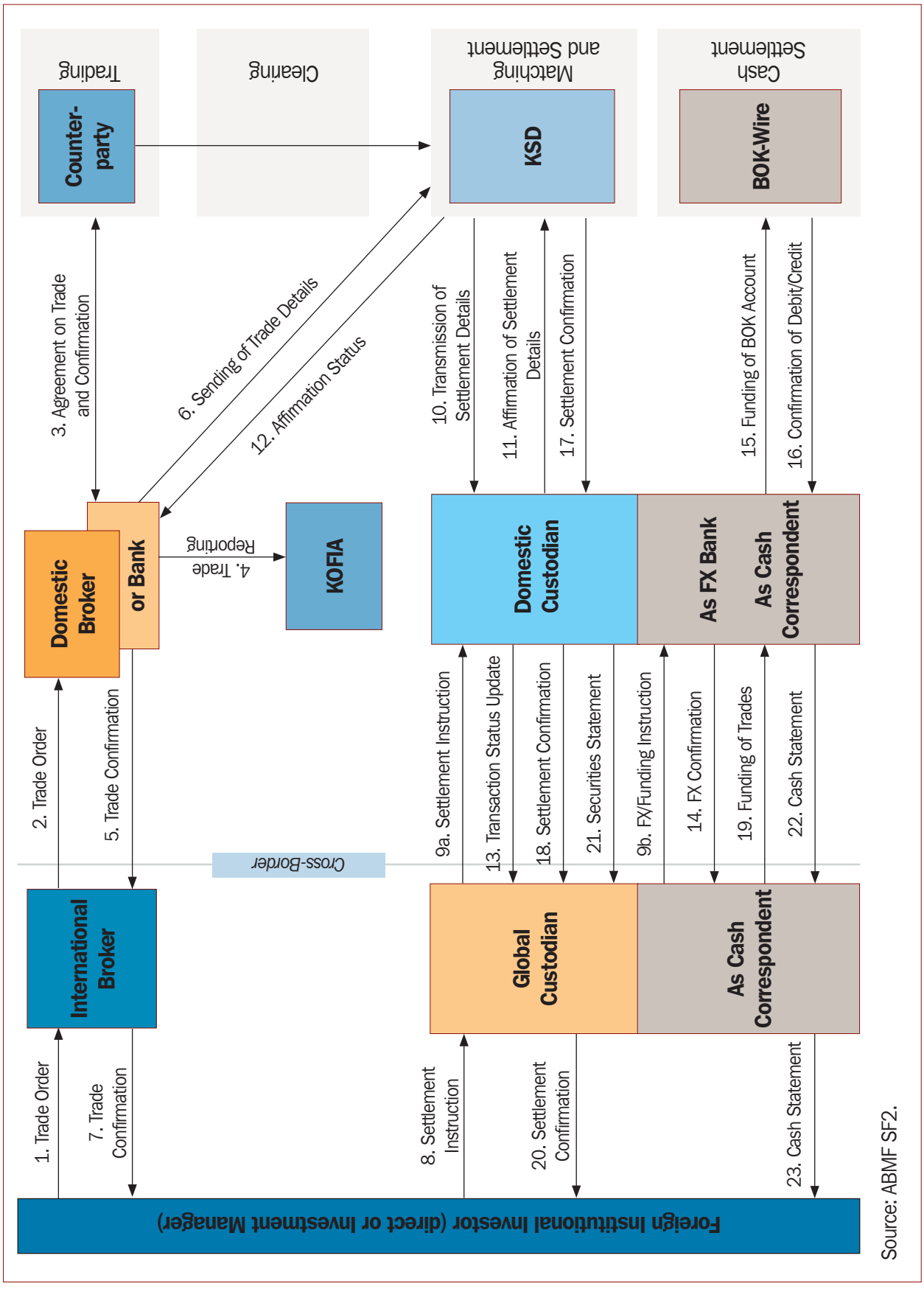
Source: ABMF SF2.

Figure 3. KOR Bond Transaction Flow for Domestic Trades Exchange Market/DVP



Source: ABMF SF2.

Figure 4. KOR Bond Transaction Flow for Foreign Investors OTC Market/DVP



Source: ABMF SF2.

Note: Description of KOR Bond Transaction Flow for Foreign Investors OTC Market/DVP

Trade Date

1. Foreign Institutional Investor places order with International Broker.
2. International Broker places order with Domestic Broker/Bank.
3. Domestic Broker/Bank trades OTC with Counterparty (via phone or e.g. Bloomberg).
4. Domestic Broker/Bank and Counterparty report trade to KOFIA within 15 minutes of trade.
5. Domestic Broker/Bank send trade confirmation to International Broker.
6. Domestic Broker/Bank sends trade details to KSD.
7. Foreign Institutional Investor receives trade confirmation.

T+1 (SD–1)

8. Foreign Institutional Investor instructs Global Custodian on securities settlement details, and FX/funding.
9. Global Custodian instructs Domestic Custodian on (a) securities settlement details, and (b) FX/funding requirements.
10. KSD sends Preliminary Settlement Data to Domestic Custodian, via SAFE.
11. Domestic Custodian affirms settlement details.
12. KSD sends affirmation status to Domestic Broker/Bank.
13. Domestic Custodian reports transaction status update to Global Custodian.
14. Domestic Custodian sends FX confirmation to Global Custodian.

Settlement Date

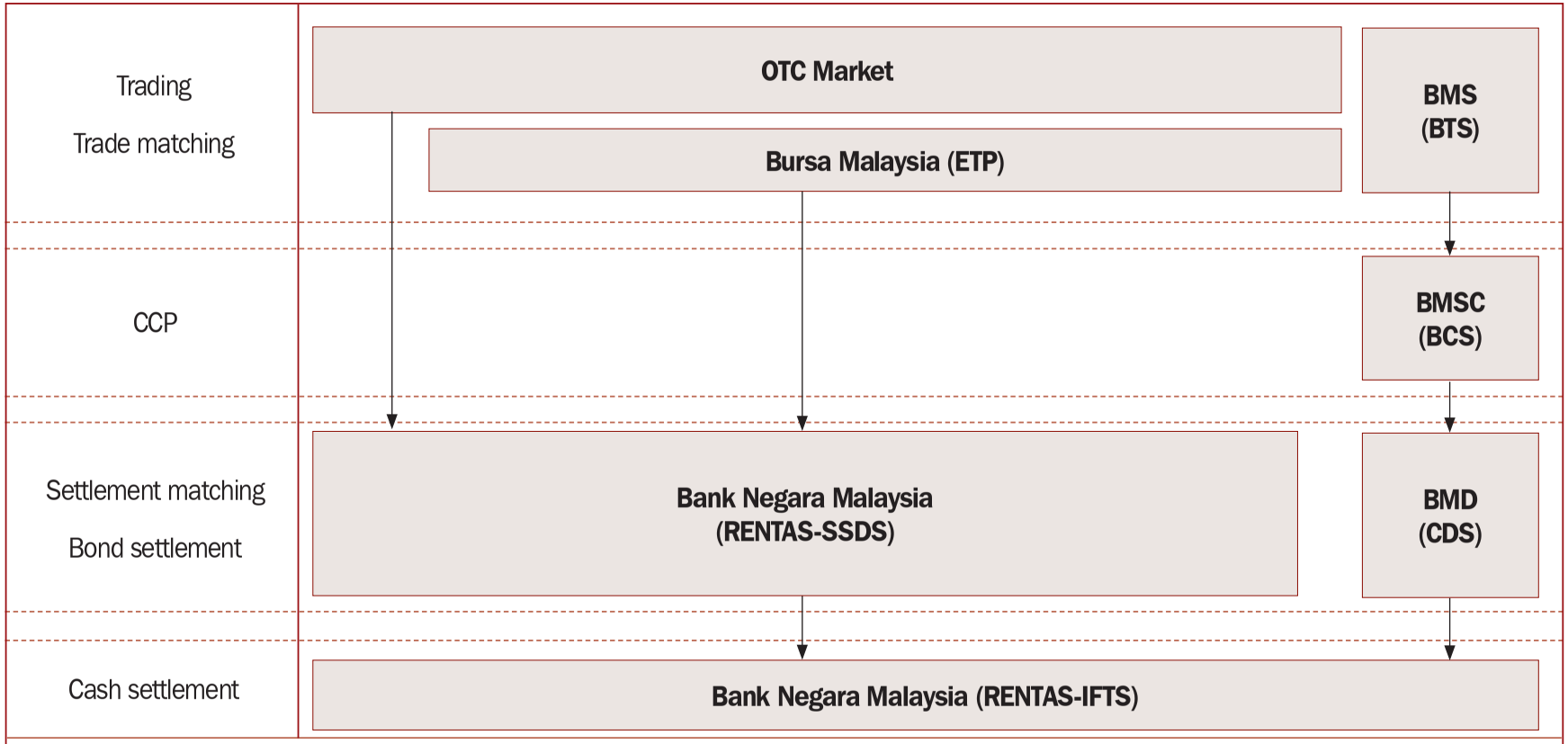
15. Domestic Custodian funds BOK account.
16. Upon transfer of cash, BOK sends settlement confirmation to Domestic Custodian.
17. Upon transfer of securities, KSD sends settlement confirmation to Domestic Custodian.
18. Domestic Custodian sends settlement confirmation to Global Custodian.
19. Global Custodian funds account with Domestic Custodian, or into FCY nostro (before end of day).
20. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
21. Domestic Custodian sends securities statement to Global Custodian.
22. Domestic Custodian sends cash credit/debit confirmation in cash statement to Global Custodian.
23. Global Custodian sends credit/debit confirmation in cash statement to Foreign Institutional Investor.

Source: ABMF SF2.

Malaysia (MAL)

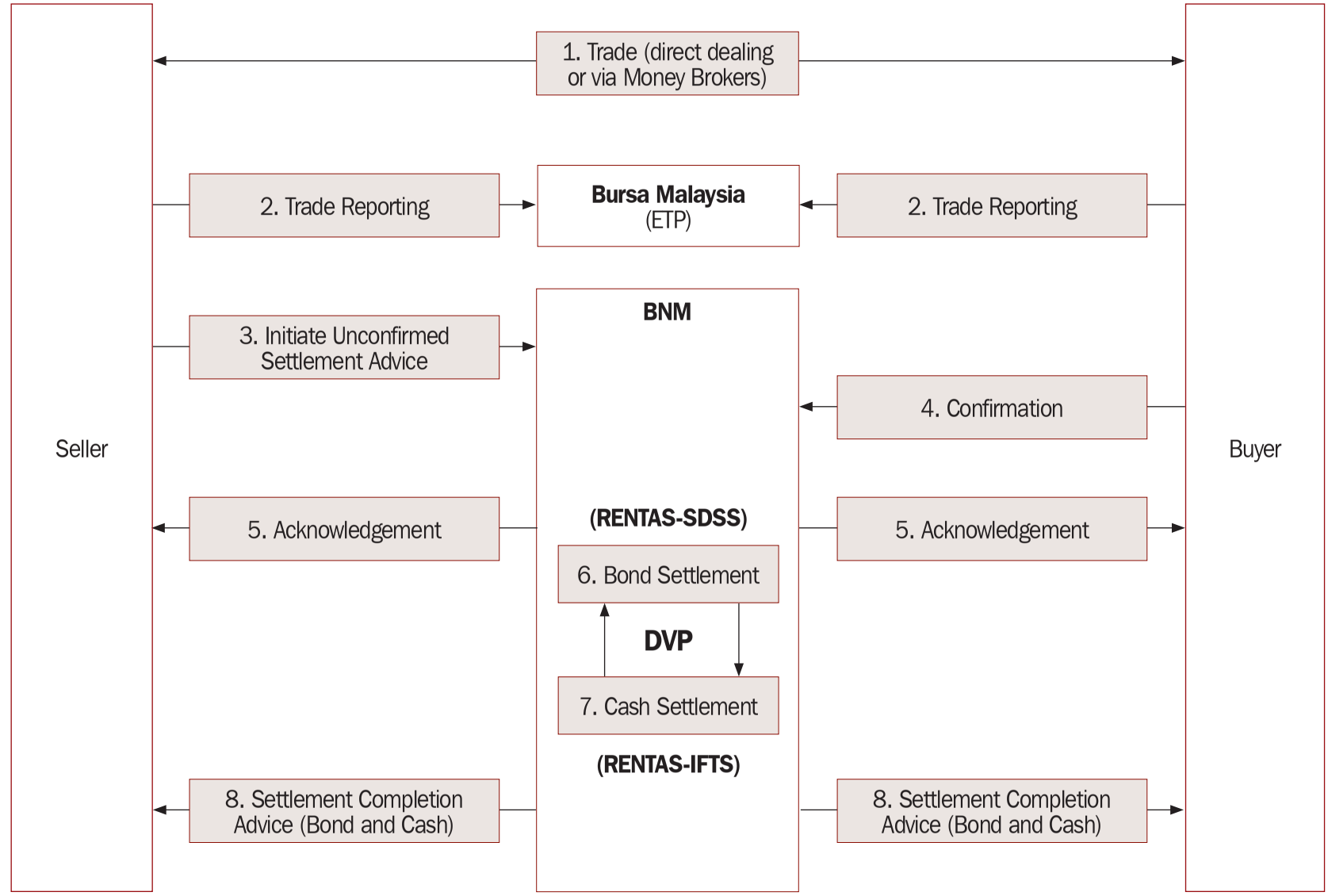
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. MAL Bond Market Infrastructure Diagram



BCS = Bursa Clearing and Settlement System; BMD = Bursa Malaysia Depository; BMS = Bursa Malaysia Securities; BMSC = Bursa Malaysia Securities Clearing; BNM = Bank Negara Malaysia; BTS = Bursa Trade System; CDS = Central Depository System; ETP = Electronic Trading Platform; IFTS = Interbank Funds Transfer System; RENTAS = Real-time Electronic Transfer of Funds and Securities; SSDS = Scripless Securities Depository System
Source: ABMF SF2.

Figure 2. MAL Bond Transaction Flow for Domestic Trades OTC Market/DVP



Source: ABMF SF2.

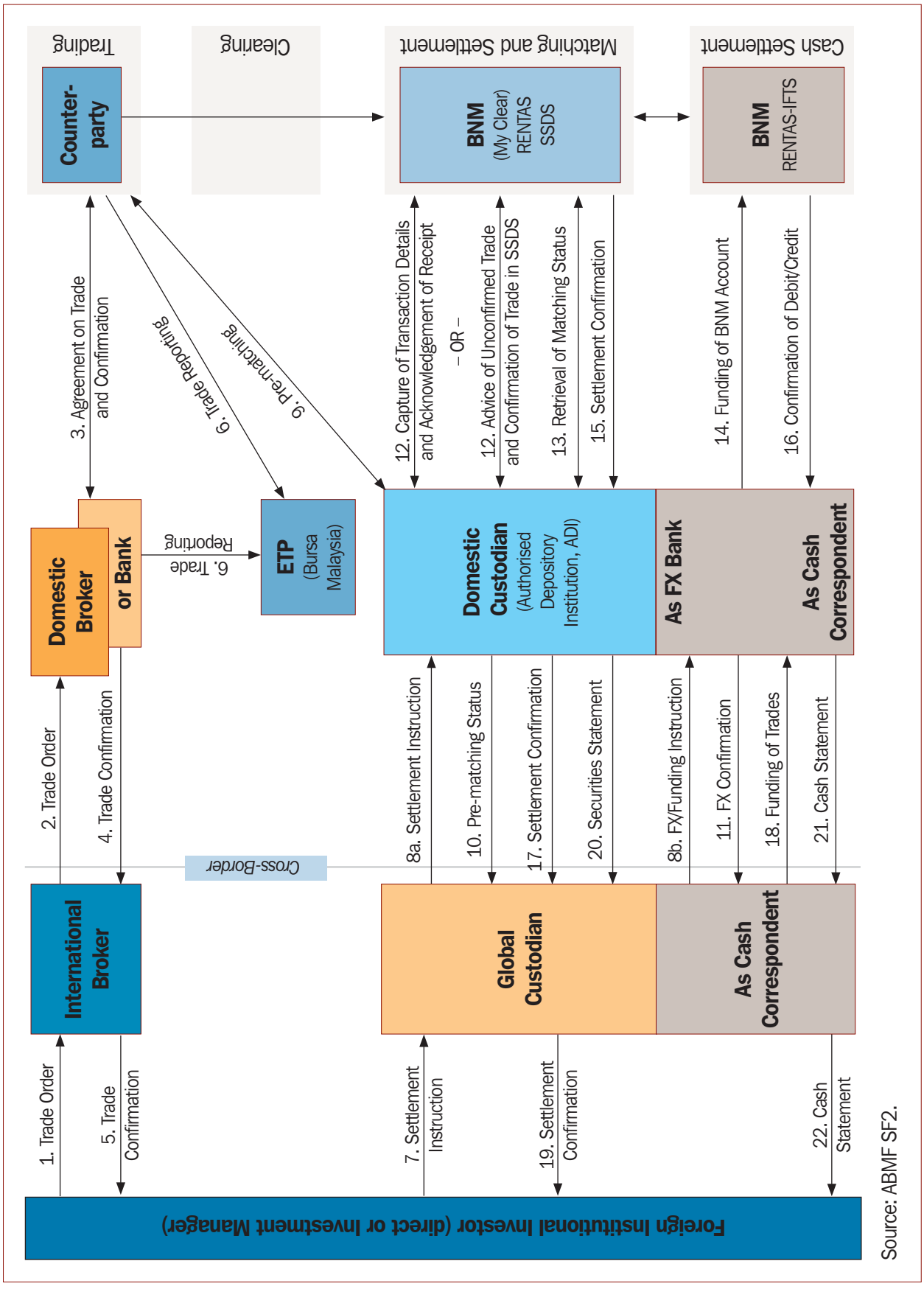
Note: Description of MAL Bond Transaction Flow for Domestic Trades OTC Market/DVP

OTC Market

1. The seller and buyer trade over the counter by telephone (direct dealing or through Money Broker). 95% of bond trades are dealt in OTC market. Commercial banks and Islamic banks can trade the bonds.
2. All trades are recorded in Electronic Trading Platform (ETP).
3. The seller (or Buyer) input trade data into RENTAS as initiate unconfirmed settlement advice.
4. The Buyer (or Seller) confirms an unconfirmed settlement advice using by Confirmation menu of RENTAS.
5. The seller and buyer access Report menu of RENTAS and confirm that confirmation of local matching is performed.
6. 7. On settlement date, bond and cash are settled on DVP basis.
8. The seller and buyer access Report menu of RENTAS and confirm report of Bond settlement and cash settlement.

Source: ABMF SF2.

Figure 3. MAL Bond Transaction Flow for Foreign Investors OTC Market/DVP



Source: ABMF SF2.

Note: Description of MAL Bond Transaction Flow for Foreign Investors OTC Market/DVP

Trade Date

1. Foreign Institutional Investor places order with International Broker.
2. International Broker places order with Domestic Broker/Bank.
3. Domestic Broker/Bank and Counterparty agrees on OTC trade (via e.g., phone or Bloomberg).
4. Domestic Broker/Bank sends trade confirmation to International Broker.
5. Foreign Institutional Investor receives trade confirmation.
6. Domestic Broker/Bank and Counterparty capture trade in ETP, by end of trading day.

T+1

7. Foreign Institutional Investor instructs Global Custodian, on securities settlement and cash/funding details.
8. Global Custodian instructs Domestic Custodian/ADI on (a) securities settlement details, (b) FX request or funding details.
9. Domestic Custodian/ADI and Counterparty pre-match settlement details, via phone.
10. Domestic Custodian/ADI sends pre-matching result information (e.g., missing instructions) to Global Custodian.
11. Domestic Custodian/ADI provides confirmation of FX booked (in case of earlier FX request).

Settlement Date

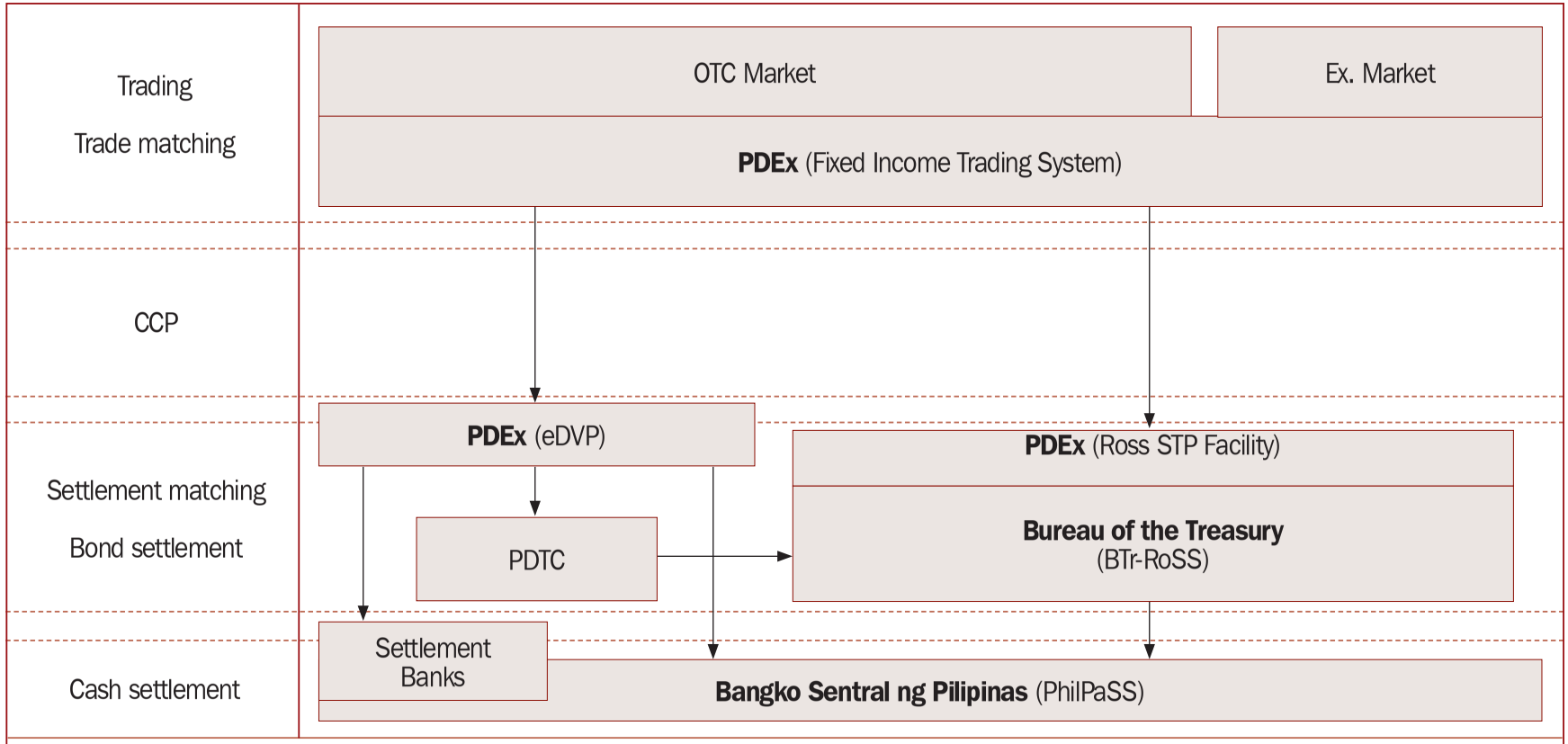
12. Domestic Custodian/ADI captures settlement details into SSDS and receives SSDS acknowledgment of receipt of data (selling side), OR receives alleged trade notice (advice of unconfirmed trade) from SSDS and confirms settlement details in SSDS (buying side).
13. Domestic Custodian/ADI retrieves settlement matching status.
14. Domestic Custodian/ADI effects funding of its account at Bank Negara Malaysia (BNM) via RENTAS (IFTS) if necessary.
15. Upon settling securities, SSDS sends settlement confirmation for securities to Domestic Custodian/ADI.
16. Upon settling cash, RENTAS sends debit/credit confirmation to Domestic Custodian/ADI.
17. Domestic Custodian/ADI sends settlement confirmation to Global Custodian.
18. Global Custodian funds account with Domestic Custodian/ADI (before end of day).
19. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
20. Domestic Custodian/ADI sends statement of securities to Global Custodian (at end of day).
21. Domestic Custodian/ADI sends debit/credit information in cash statement (at end of day).
22. Global Custodian sends debit/credit information in cash statement to FII (at end of day).

Source: ABMF SF2.

Philippines (PHI)

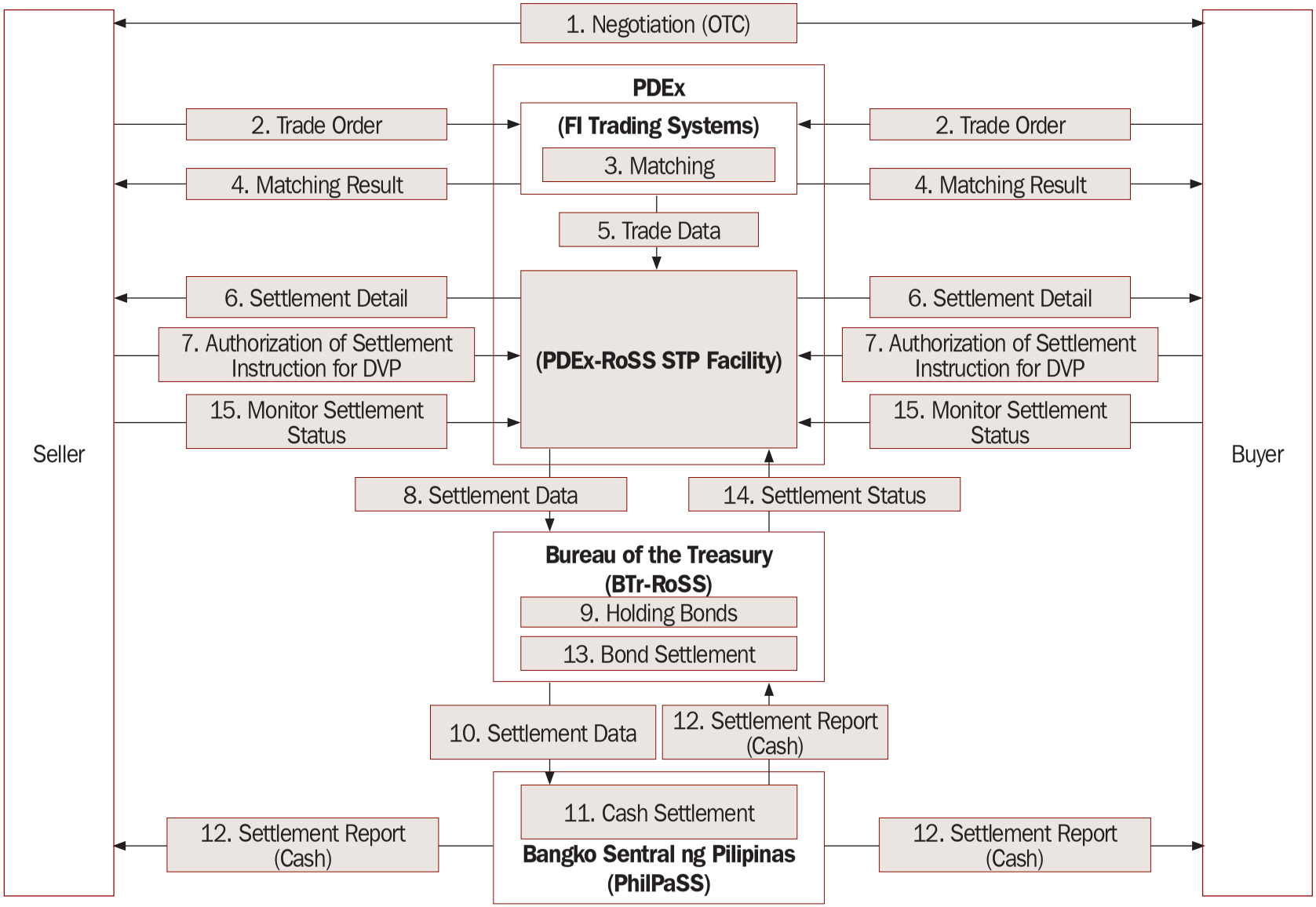
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. PHI Bond Market Infrastructure Diagram



Note: Cash settlement by settlement banks is for government and corporate bonds.
eDVP = Expanded Delivery vs. Payment System; PDEx = Philippine Dealing and Exchange; PDTC = Philippine Depository and Trust Corporation; PhilPaSS = Philippine Payments and Settlement System; RoSS = Registry of Scripless Securities
Source: ABMF SF2.

Figure 2. PHI Bond Transaction Flow for Domestic Trades GSEDs Market/DVP



Source: ABMF SF2.

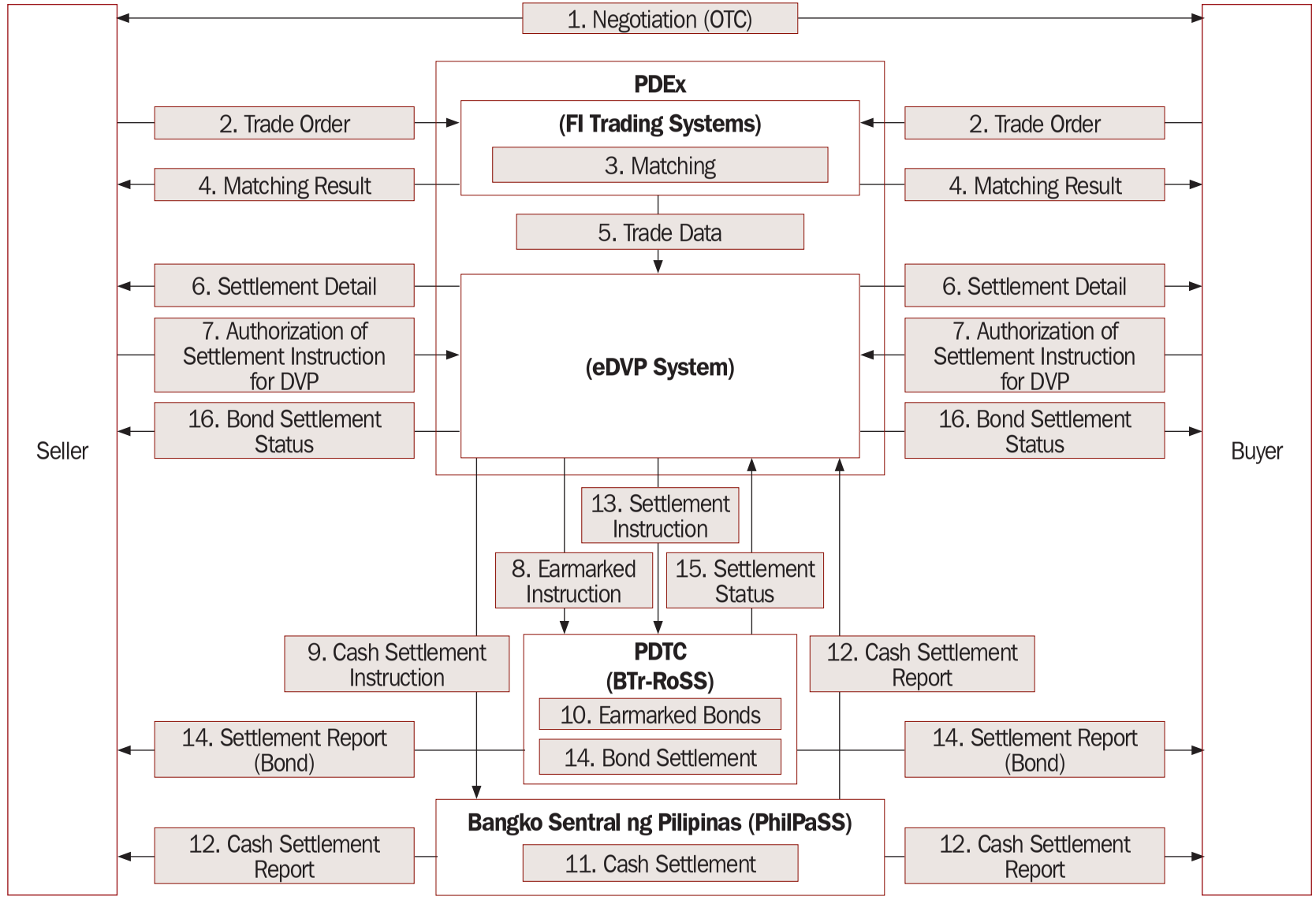
Note: Description of PHI Bond Transaction Flow for Domestic Trades GSEDs* Market/DVP

GSEDs

1. In OTC market, the seller and buyer negotiate before they input the trade data to PDEx. This process is omitted in the Exchange Market.
2. The seller and buyer trade via PDEx(FI Trading System).
3. PDEx(FI Trading System) matches order or records negotiated deals between buyer and seller.
4. PDEx(FI Trading System) sends matching result to the seller and buyer.
5. PDEx(FI Trading System) sends trade data to PDEx(PDEx-RoSS STP Facility).
6. PDEx(PDEx-RoSS STP Facility) sends settlement detail to the seller and buyer.
7. The seller and buyer authorize the settlement instruction for DVP.
8. PDEx(PDEx-RoSS STP Facility) sends settlement data to Bureau of the Treasury Registry of Scripless Securities (BTr-RoSS).
9. BTr-RoSS holds bonds before cash settlement.
10. BTr-RoSS sends settlement data to Bangko Sentral ng Pilipinas (BSP).
11. BSP executes cash settlement.
12. BSP sends cash settlement report to seller, buyer and BTr-RoSS.
13. BTr-Ross executes bond settlement.
14. BTr-Ross sends bond settlement status to PDEx-RoSS STP Facility.
15. The seller and the buyer can monitor settlement status via PDEx-RoSS STP Facility.

*GSED = Government Securities Eligible Dealer
Source: ABMF SF2.

Figure 3. PHI Bond Transaction Flow for Domestic Trades Non-GSEDs Market/DVP



Source: ABMF SF2.

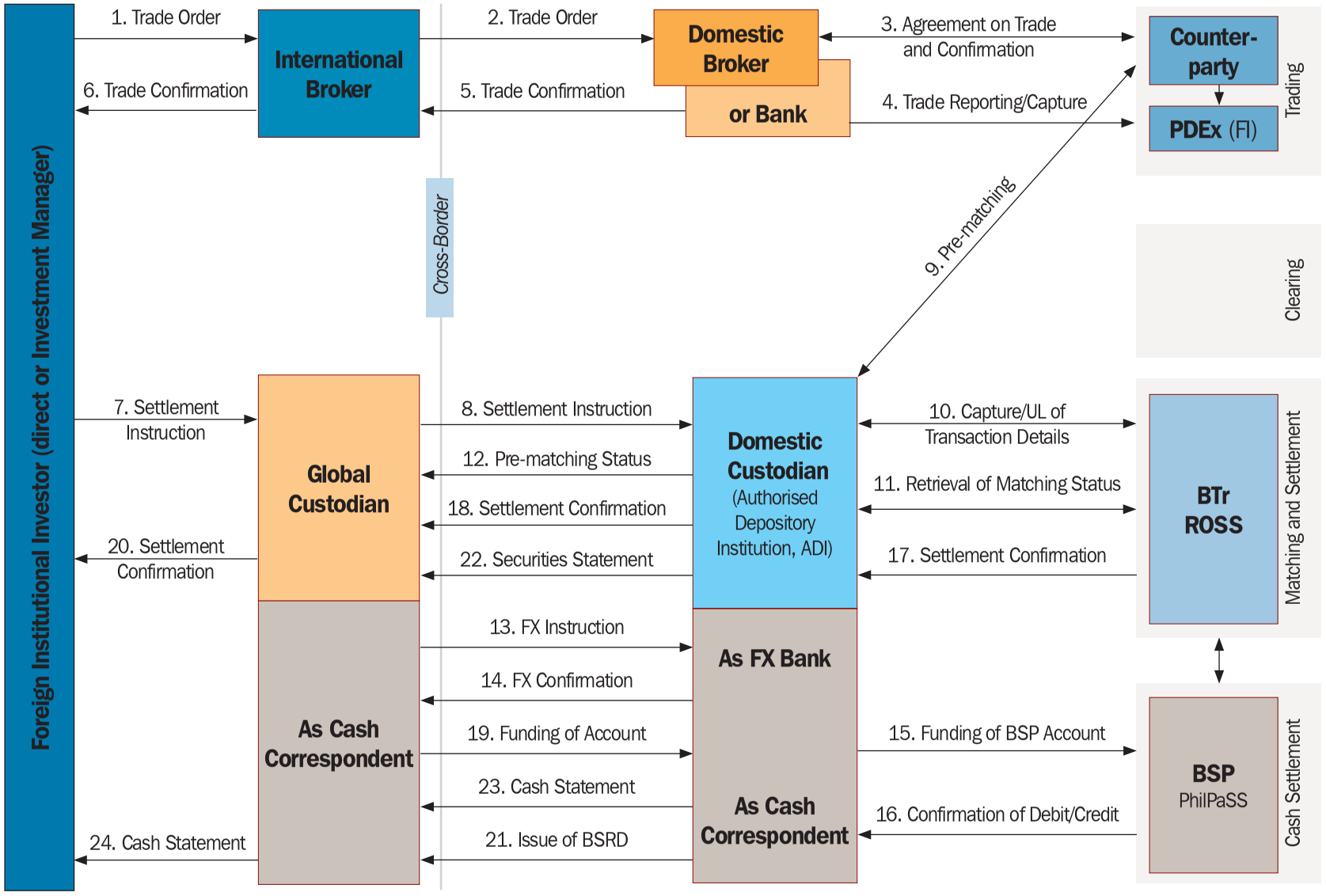
Note: Description of PHI Bond Transaction Flow for Domestic Trades Non-GSEDs* Market/DVP

Non-GSEDs

1. In OTC market, the seller and buyer negotiate before they input the trade data to PDEx. This process is omitted in the Exchange Market.
2. The seller and buyer trade via PDEx(FI Trading System).
3. PDEx (FI Trading System) automatically matches orders from seller and buyer.
4. PDEx (FI Trading System) sends matching results to the seller and buyer.
5. PDEx (FI Trading System) sends trade data to PDEx (eDVP System).
6. PDEx (eDVP System) sends settlement details to the seller and buyer.
7. The seller and buyer authorize the settlement instruction for DVP.
8. PDEx (eDVP System) sends earmarked instruction to PDTC.
9. PDEx (eDVP System) sends cash settlement instruction to BSP.
10. PDTC and BTr-RoSS holds bonds before cash settlement. PDTC acts as sub-registry.
11. BSP executes cash settlement.
12. BSP sends cash settlement report to the seller, buyer, and PDEx (eDVP System).
13. PDEx (eDVP System) sends settlement instruction to Philippine Depository and Trust Corp (PDTC) and BTr-RoSS.
14. PDTC and BTr-RoSS executes bond settlement.
15. PDTC and BTr-RoSS sends settlement status to PDEx (eDVP System).
16. PDEx (eDVP System) sends bond settlement status to the seller and buyer.

*GSED = Government Securities Eligible Dealer
Source: ABMF SF2.

Figure 4. PHI Bond Transaction Flow for Foreign Investors OTC Market/DVP



Source: ABMF SF2.

Note: Description of PHI Bond Transaction Flow for Foreign Investors OTC Market/DVP

Trade Date

1. Foreign Institutional Investor places order with International Broker.
2. International Broker places order with Domestic Broker/GSED.
3. Domestic Broker or Dealer trades OTC with Counterparty.
4. Domestic Broker or Dealer captures trade in PDEx system, for price discovery, within 10 minutes.
5. International Broker receives trade confirmation.
6. Foreign Institutional Investor receives trade confirmation.

T+1

7. Foreign Institutional Investor instructs Global Custodian, on securities settlement and FX/cash funding details.
8. Global Custodian instructs Domestic Custodian on securities settlement details.
9. Domestic Custodian conducts phone pre-matching with Counterparty or custodian of counterparty.

Settlement Date

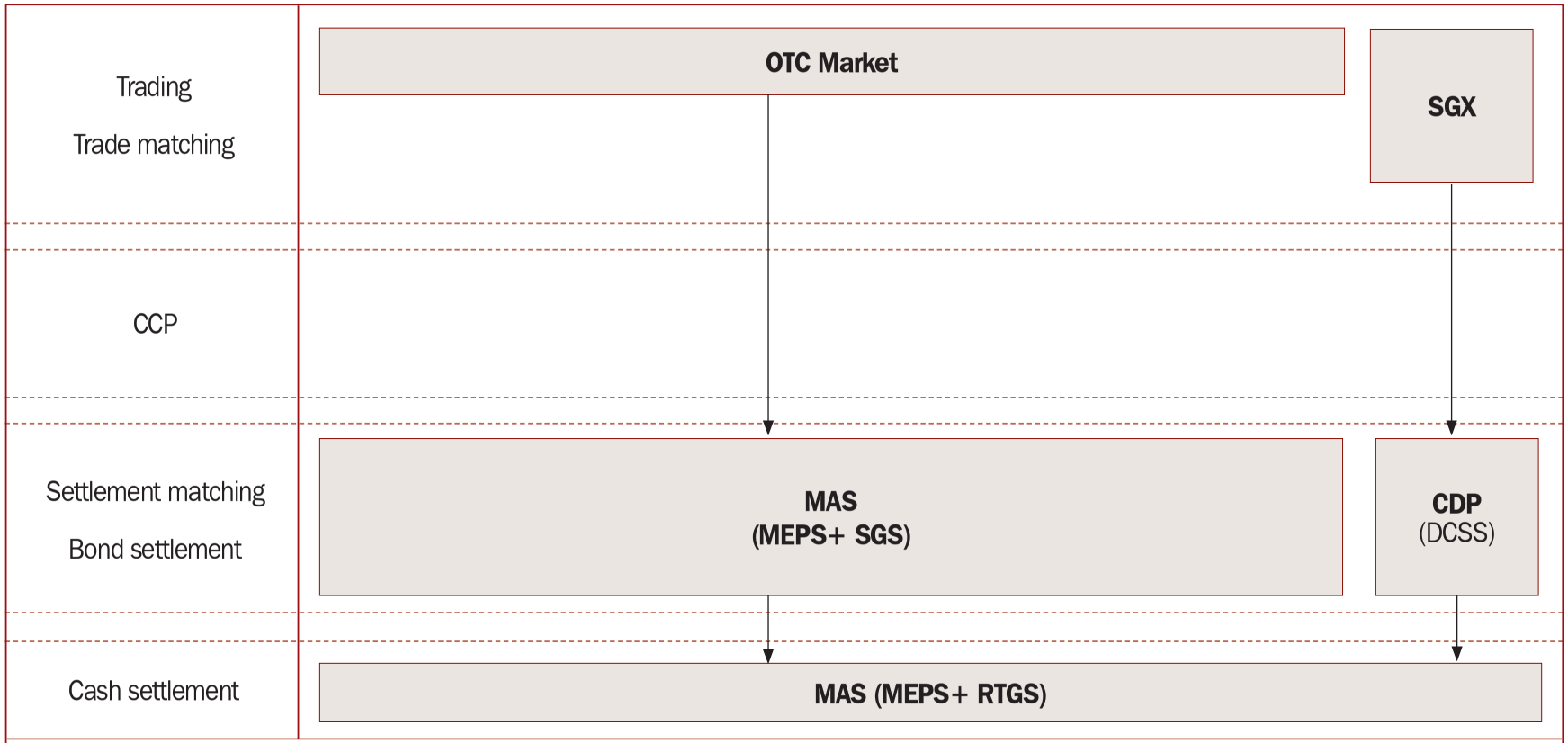
10. Domestic Custodian enters settlement data into BTr-RoSS.
11. Domestic Custodian retrieves transaction matching status.
12. Domestic Custodian reports matching status update to Global Custodian.
13. Global Custodian sends FX instruction for projected funding requirements.
14. Domestic Custodian sends FX confirmation.
15. Domestic Custodian funds BSP accounts, via PhilPASS (RTGS) if necessary.
16. Upon transfer of cash (after prompting from BTr-RoSS), PhilPaSS sends cash settlement confirmation to Domestic Custodian.
17. Upon confirmation of cash settlement, BTr-RoSS effects bond settlement, sends confirmation to Domestic Custodian.
18. Domestic Custodian sends settlement confirmation to Global Custodian.
19. Global Custodian funds account with Domestic Custodian in PHP, or into FCY nostro (before end of day).
20. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
21. Domestic Custodian issues BSRD (Bangko Sentral Remittance Document), certifying FCY inflow for ability to repatriate at later stage without consideration of FX limitations.
22. Domestic Custodian sends securities statement to Global Custodian.
23. Domestic Custodian sends debit/credit confirmations, in form of cash statement, to Global Custodian.
24. Global Custodian sends cash statement to Foreign Institutional Investor.

Source: ABMF SF2.

Singapore (SIN)

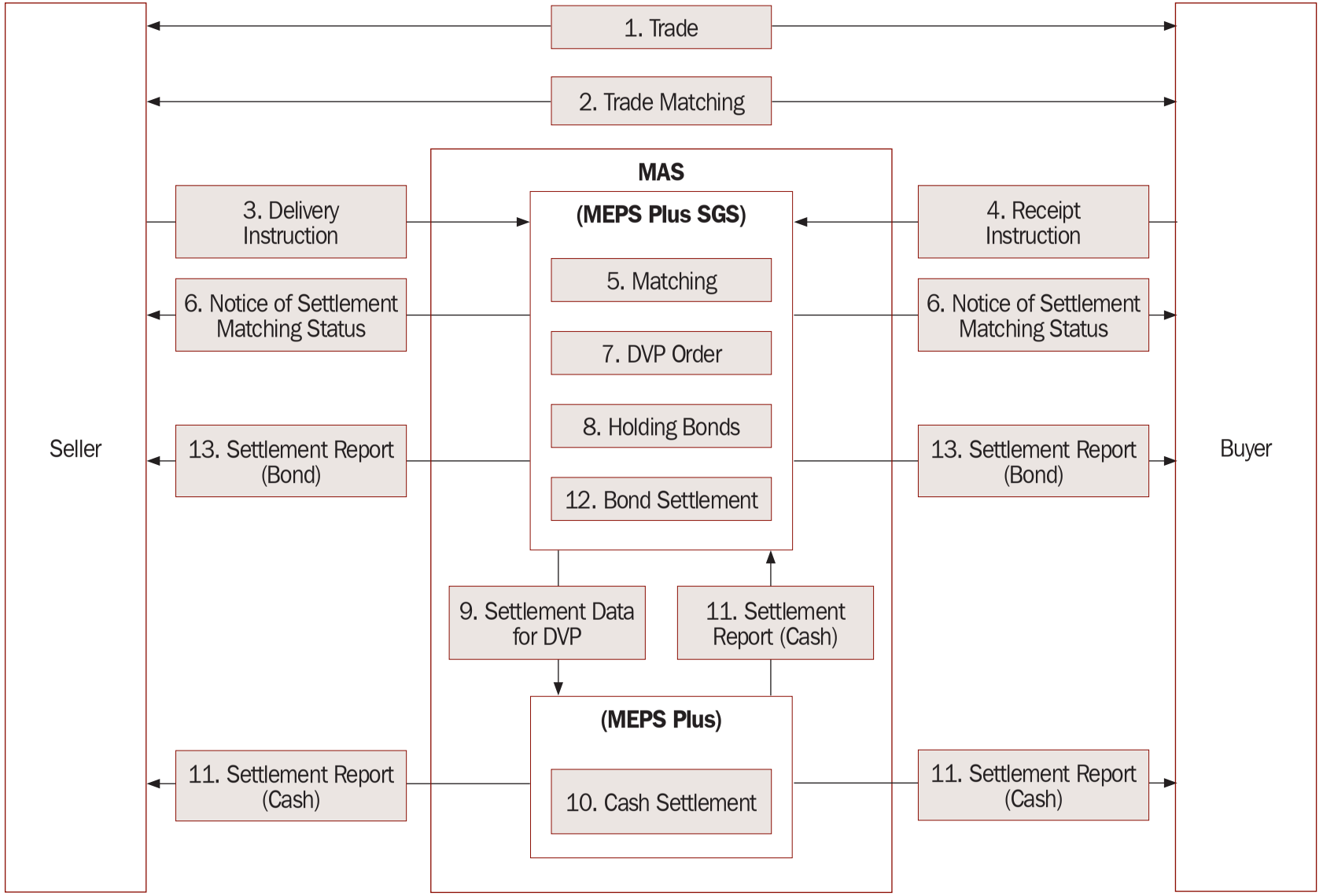
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. SIN Bond Market Infrastructure Diagram



CDP = Central Depository (Pte.) Ltd.; DCSS = Debt Securities Clearing and Settlement System; MAS = Monetary Authority of Singapore; MEPS+ = MAS Electronic Payment System; SGX = Singapore Exchange Ltd.
Source: ABMF SF2.

Figure 2. SIN Bond Transaction Flow for Domestic Trades OTC Market/DVP



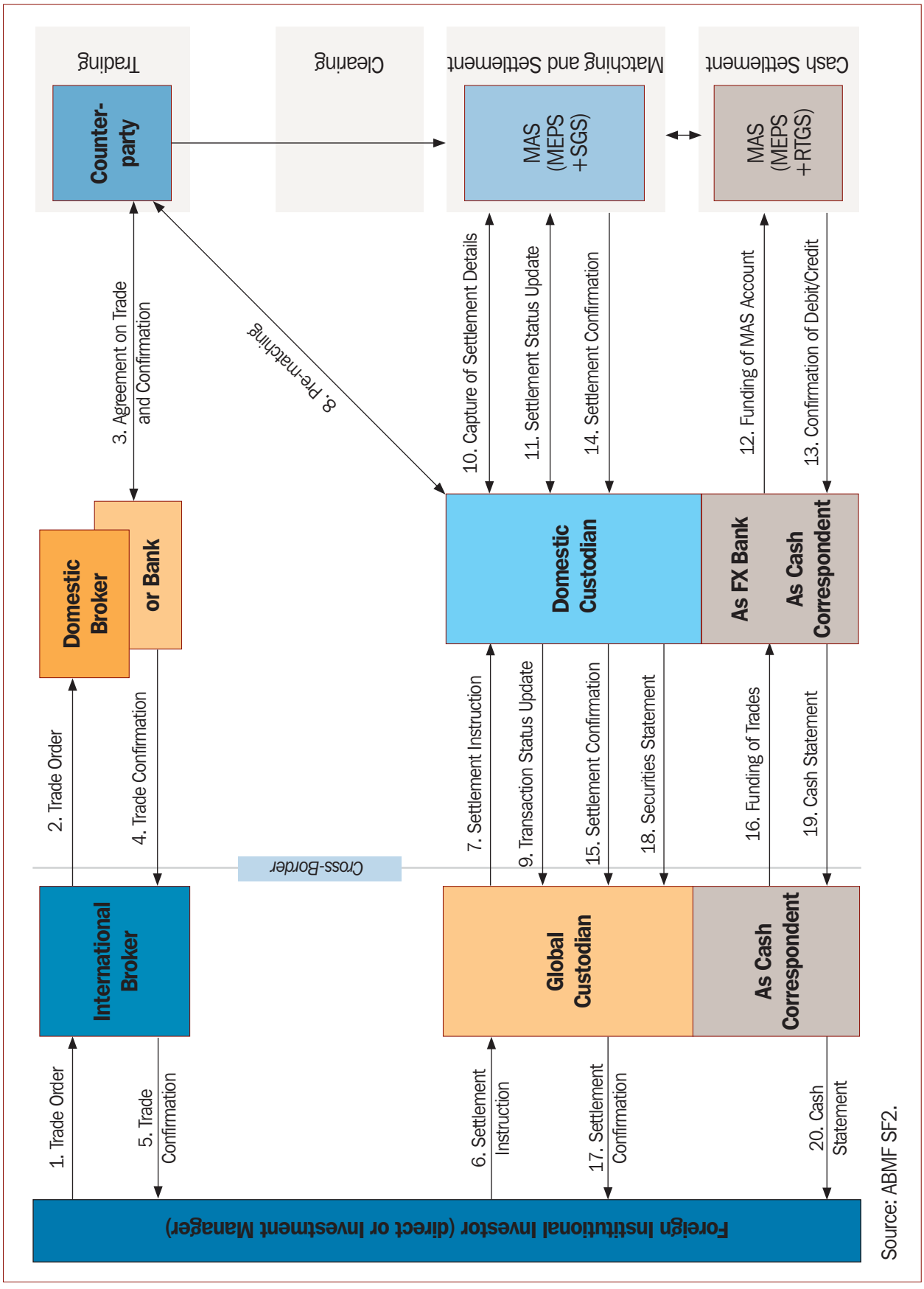
Source: ABMF SF2.

Note: Description of SIN Bond Transaction Flow for Domestic Trades OTC Market/DVP

1. SGS (Singapore government securities) is done on an over-the-counter basis.
2. Trades are matched among seller and buyer.
3. The bond seller sends the agreed trade instruction to MEPS+ SGS.
4. The bond buyer sends the agreed trade instruction to MEPS+ SGS.
5. MEPS+ SGS performs bond matching.
6. MEPS+ SGS sends the notice of bond matching status to seller and buyer.
7. MEPS Plus Book-entry clearing system creates the DVP order.
8. When the seller's SGS account has sufficient SGS, the SGS are earmarked for transfer to the buyer.
9. Settlement data for DVP is sent to MEPS+ RTGS.
10. When the funds are available, the amount is debited from the buyer's RTGS account and credited to the seller's RTGS account.
11. MEPS+ RTGS simultaneously MEPS+ SGS to transfer the securities and report the cash settlement status to both sides of the trade.
12. MEPS+ SGS transfers the bonds to the buyer's account.
13. MEPS+ SGS reports the settlement status to both seller and buyer.

Source: ABMF SF2.

Figure 3. SIN Bond Transaction Flow for Foreign Investors OTC Market/DVP



Source: ABMF SF2.

Note: Description of SIN Bond Transaction Flow for Foreign Investors OTC Market/DVP

Trade Date

1. Foreign Institutional Investor places order with International Broker.
2. International Broker places order with Domestic Broker or Bank.
3. Domestic Broker/Bank trades OTC with Counterparty (via phone, Bloomberg).
4. Domestic Broker/Bank sends trade confirmation to International Broker.
5. Foreign Institutional Investor receives trade confirmation.

Settlement Date/T+1

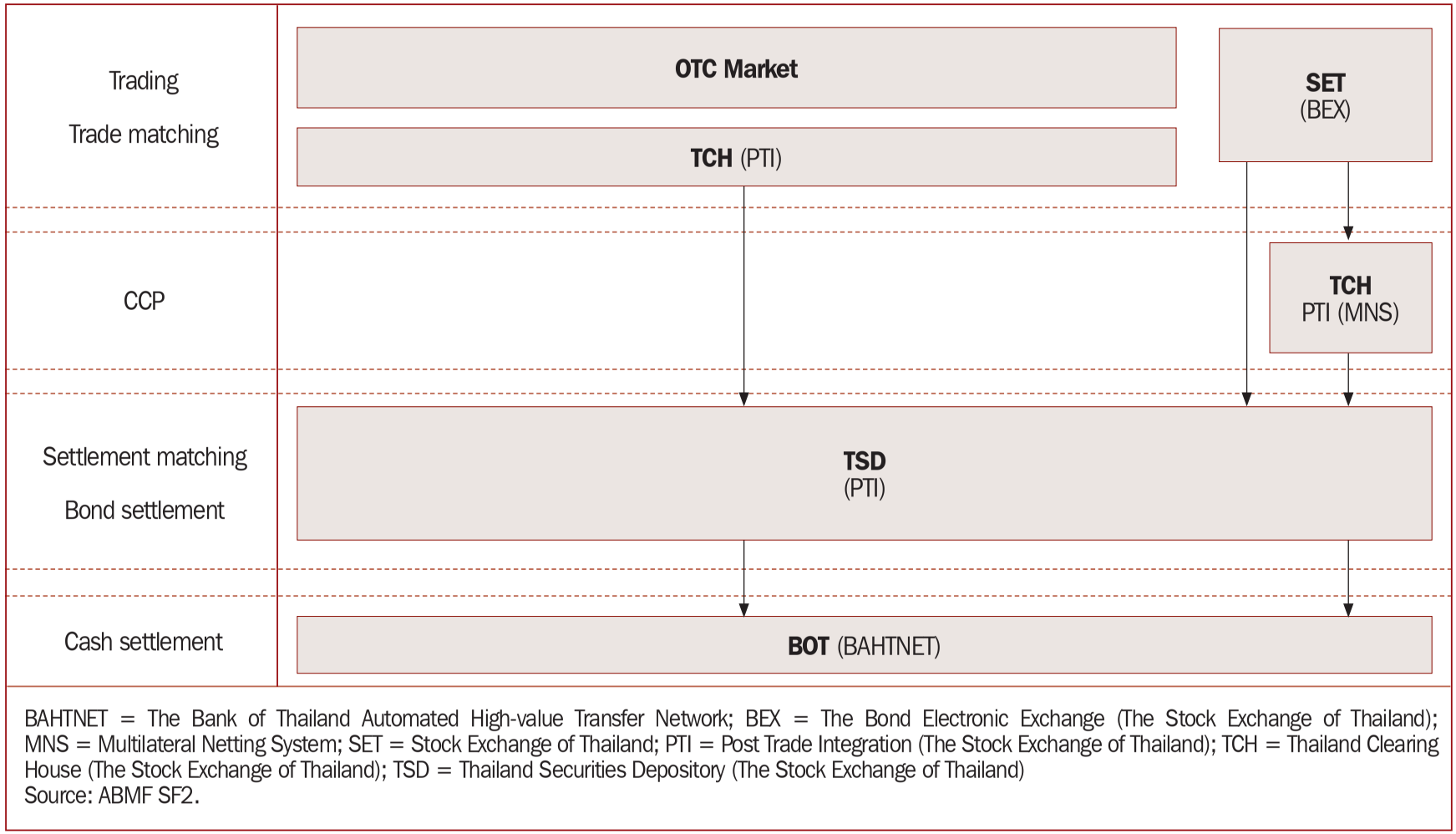
6. Foreign Institutional Investor instructs Global Custodian on securities settlement details and funding details.
7. Global Custodian instructs Domestic Custodian on securities settlement details.
8. Domestic Custodian and Counterparty pre-match settlement details, via phone.
9. Domestic Custodian provides result of pre-matching to Global Custodian.
10. Domestic Custodian transmits settlement details to MEPS+ SGS.
11. Domestic Custodian monitors settlement status updates (online).
12. Domestic Custodian funds MAS account via MEPS+ RTGS.
13. Upon transfer of cash, debit/credit confirmation from MEPS+ RTGS.
14. Upon transfer of securities, settlement confirmation from MAS, via MEPS+ SGS.
15. Domestic Custodian sends settlement confirmation to Global Custodian.
16. Global Custodian funds SGD account with Domestic Custodian, or FCY nostro (before end of day).
17. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
18. Domestic Custodian sends securities statement to Global Custodian.
19. Domestic Custodian sends debit/credit confirmations as cash statement to Global Custodian.
20. Global Custodian sends cash statement to Foreign Institutional Investor.

Source: ABMF SF2.

Thailand (THA)

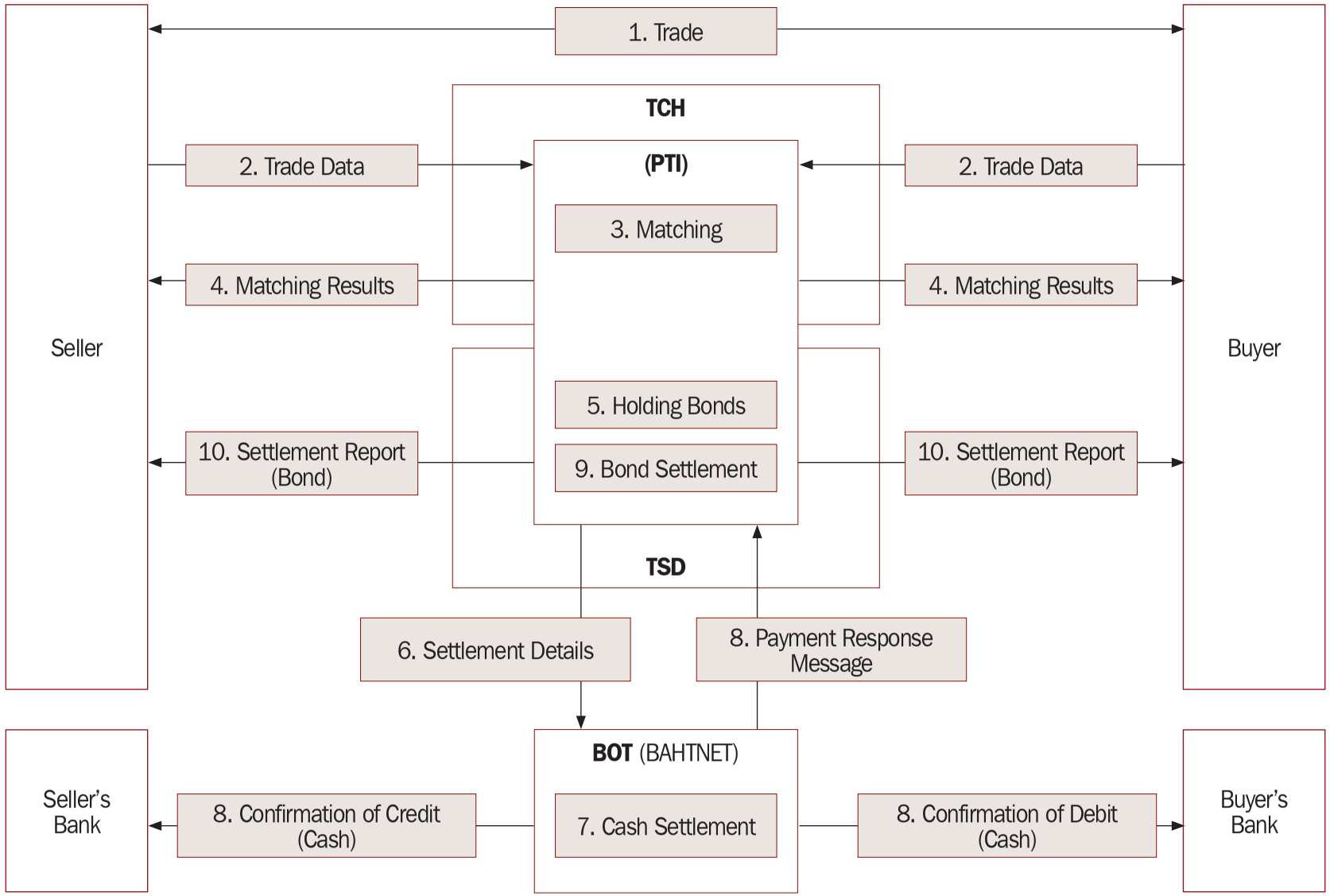
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. THA Bond Market Infrastructure Diagram



BAHTNET = The Bank of Thailand Automated High-value Transfer Network; BEX = The Bond Electronic Exchange (The Stock Exchange of Thailand); MNS = Multilateral Netting System; SET = Stock Exchange of Thailand; PTI = Post Trade Integration (The Stock Exchange of Thailand); TCH = Thailand Clearing House (The Stock Exchange of Thailand); TSD = Thailand Securities Depository (The Stock Exchange of Thailand)
Source: ABMF SF2.

Figure 2. THA Bond Transaction Flow for Domestic Trades OTC Market/DVP



Source: ABMF SF2.

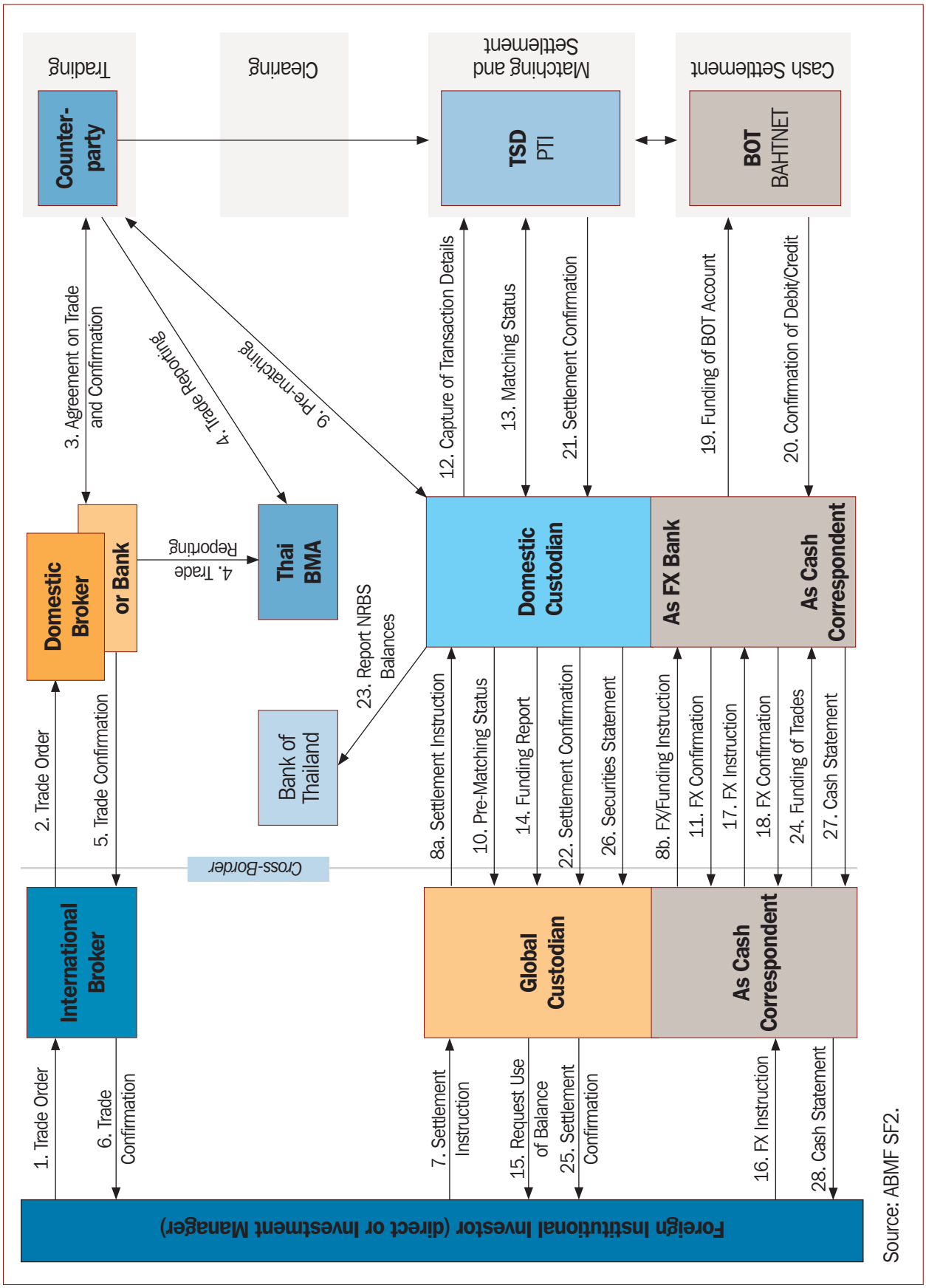
Note: Description of THA Bond Transaction Flow for Domestic Trades OTC Market/DVP

OTC Market

1. Seller and buyer trade via OTC market.
2. Seller and buyer send the transaction details to TCH via PTI System.
3. TCH matches trade data from seller and buyer.
4. TCH sends matching results to seller and buyer via PTI System.
5. TCH sends settlement details to TSD. Then, TSD checks availability and blocks securities in member account.
6. TSD sends cash settlement details to BOT.
7. BOT executes cash settlement.
8. BOT sends cash settlement confirmation to seller, buyer and TSD.
9. TSD releases blocked and executes securities delivery.
10. TSD sends settlement reports to seller, buyer and TCH via PTI System.

Source: ABMF SF2.

Figure 3. THA Bond Transaction Flow for Foreign Investors OTC Market/DVP



Source: ABMF SF2.

Note: Description of THA Bond Transaction Flow for Foreign Investors OTC Market/DVP

Trade Date

1. Foreign Institutional Investor places order with International Broker.
2. International Broker places order with Domestic Broker/Bank.
3. Domestic Broker/Bank trades OTC with Counterparty (via phone or Bloomberg).
4. Domestic Broker/Bank and Counterparty report trade to Thai BMA within 30 minutes of trade (web input or, e.g., via Bloomberg).
5. Domestic Broker/Bank sends trade confirmation to International Broker.
6. Foreign Institutional Investor receives trade confirmation.

T+1

7. Foreign Institutional Investor instructs Global Custodian on securities settlement and cash/funding details.
8. Global Custodian instructs Domestic Custodian on (a) securities settlement details, (b) FX request or funding details.
9. Domestic Custodian pre-matches with Counterparty, typically via phone.
10. Domestic Custodian sends pre-matching results to Global Custodian.
11. Domestic Custodian sends FX confirmation to Global Custodian.

Settlement Date

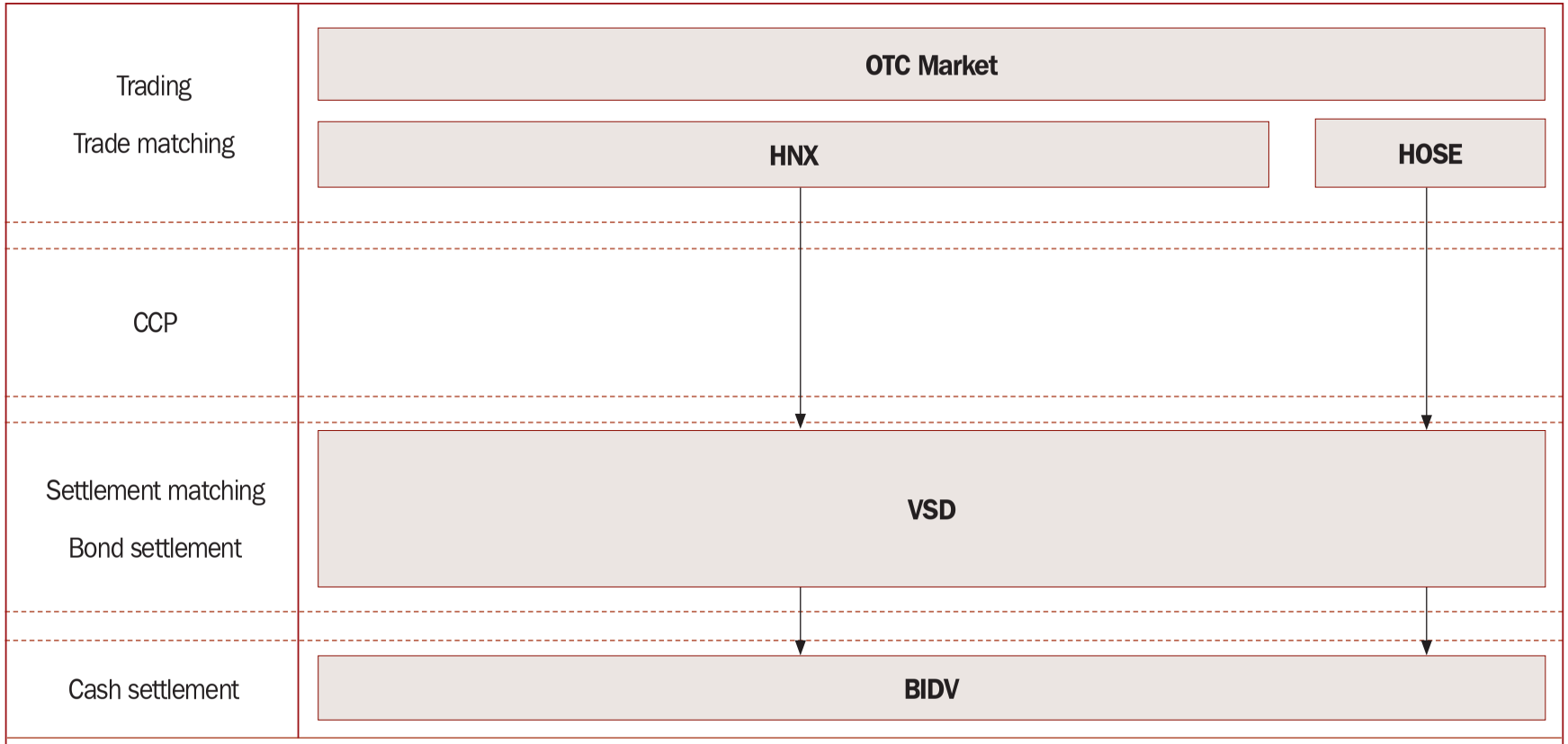
12. Domestic Custodian captures settlement details in PTI.
13. Domestic Custodian retrieves matching results, via TSD terminal.
14. Domestic Custodian sends funding report to Global Custodian.
15. Global Custodian sends, if so required, request to use THB balance to Foreign Institutional Investor.
16. Foreign Institutional Investor sends, if so required, FX instruction (or additional securities purchase trade) to Global Custodian.
17. Global Custodian, if so required, sends FX instruction to Domestic Custodian, as FX bank.
18. Domestic Custodian, as FX bank, confirms FX deal.
19. Domestic Custodian funds clearing account at Bank of Thailand.
20. Upon cash settlement/transfer, BAHTNET sends credit/debit confirmation to Domestic Custodian (as BAHTNET participant).
21. Upon cash settlement confirmation, TCH/TSD transfers securities and sends settlement confirmation to Domestic Custodian.
22. Domestic Custodian sends settlement confirmation to Global Custodian.
23. Domestic Custodian reports clients' NRBS account balances to Bank of Thailand (prior to end of day).
24. Global Custodian funds account with Domestic Custodian directly, or into FCY nostro account (by end of day).
25. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
26. Domestic Custodian sends statement of securities to Global Custodian (end of day).
27. Domestic Custodian sends cash credit/debit information in cash statement to Global Custodian (end of day).
28. Global Custodian sends cash credit/debit information to FII in cash statement (end of day).

Source: ABMF SF2.

Viet Nam (VIE)

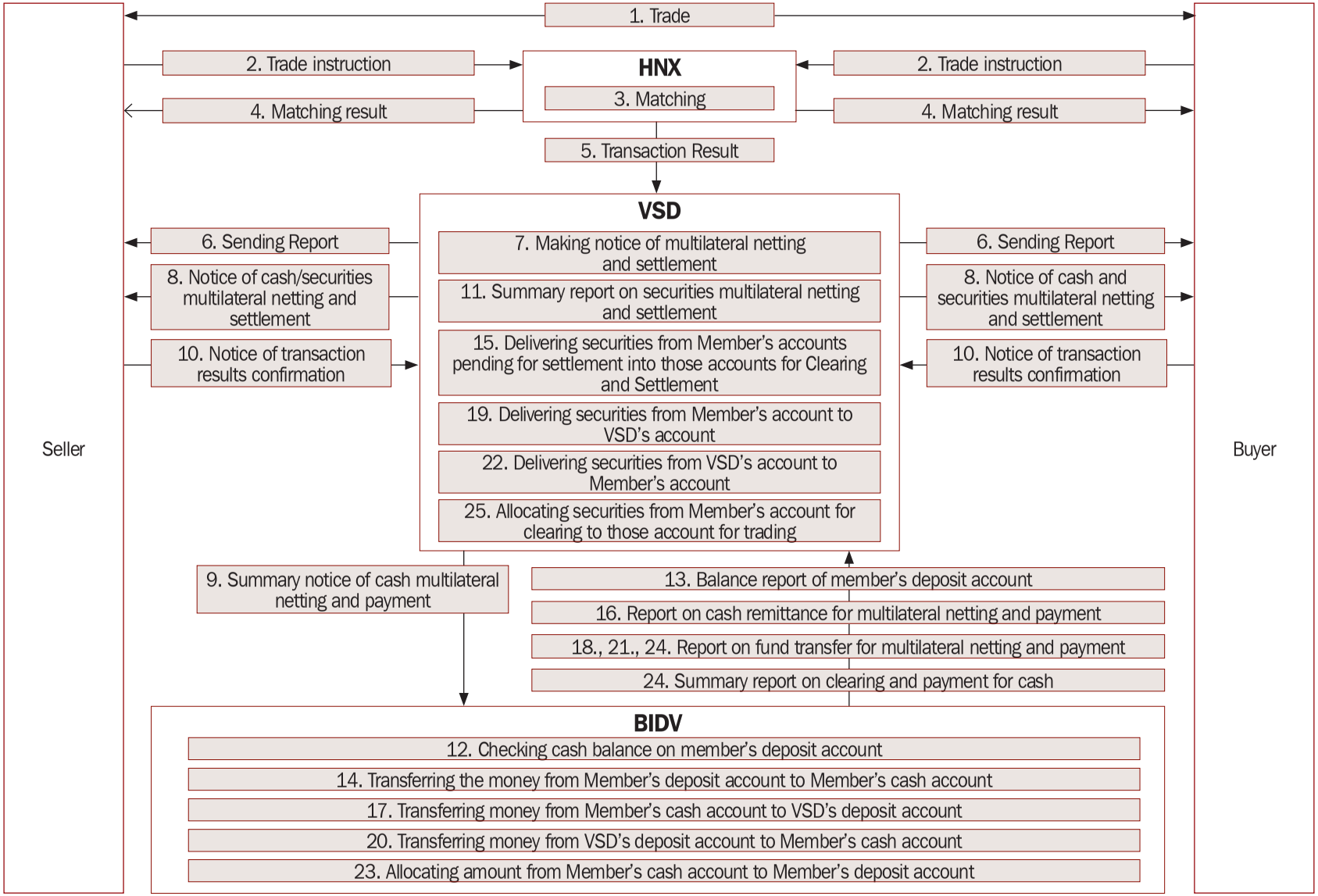
Bond Market Infrastructures and Bond Transaction Flow

Figure 1. VIE Bond Settlement Infrastructure Diagram



Note: Definition of trade date is different from other countries in Viet Nam since trade date is regarded as the date when securities are traded on stock exchange (in case of listed securities) or date when traded data are entered to HNX system (in case of trade registered securities). But, actual trade is agreed on OTC market before the date.
BIDV = Bank for Investment and Development of Vietnam; HOSE = Ho Chi Minh Stock Exchange; HNX = The Hanoi Stock Exchange; VSD = Vietnam Securities Depository
Source: ABMF SF2.

Figure 2. VIE Business Process Flow Government Bond Market/DVP



Source: ABMF SF2.

Note: Description of VIE Business Process Flow Government Bond Market/DVP (1/2)

OTC Market

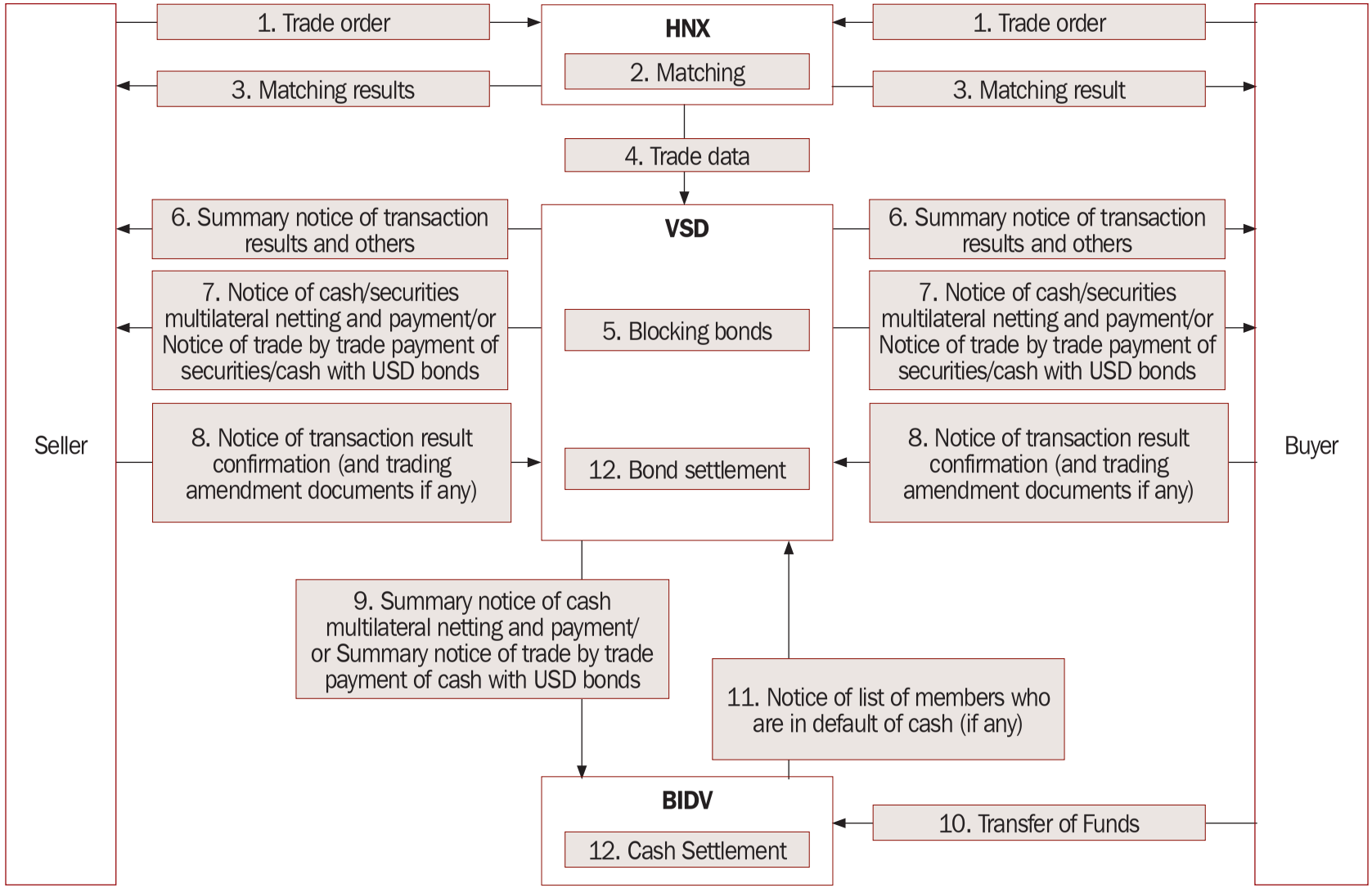
1. The seller and buyer execute bond trades via direct negotiation methods. Trade is executed before trading day, because trading day is the day when the seller and buyer input the instruction into the system.
2. Both the seller and buyer input trade instruction into the exchange system of HNX.
3. After inputting, the exchange system automatically matches the trade instructions.
4. Trading result is confirmed to the seller and buyer.
5. Each exchange market sends transaction result to VSD. VSD checks bond holding information of depository member's clients.
6. VSD makes and sends reports to members including: Summary notice of transaction results; Notice of accounts lacking securities for settlement; and Notice of updating investor's information. After receiving the report, members check their transactions.
7. From 14:30 to 15:30, VSD makes notice of multilateral netting and settlement.
8. From 15:30 to 16:00, VSD sends to each member "Notice of cash multilateral netting and payment" and "Notice of securities multilateral netting and settlement".
9. From 15:30 to 16:00, VSD sends to the settlement bank: "Summary notice of cash multilateral netting and payment" From 16:00 to 16:30, VSD sends to the settlement bank in the form of files via a line between VSD and the settlement bank. After successfully sending exported file, VSD informs the result to the settlement bank.
10. By 8:30 of the settlement day (T+1), members send "Notice of transaction result confirmation" and error correction proposal (if any) to VSD. If VSD fails to receive "Notice of transaction result confirmation" from members, all transactions shall be deemed exact and confirmed.
11. VSD makes and files "summary report on securities multilateral netting and settlement."
12. From 11:00 to 11:30, BIDV checks cash balance on member's deposit account for clearing and settlement (to ensure settlement for securities transactions in line with VSD's notice).
13. BIDV sends the balance report of member's deposit account for clearing and settlement to VSD.
14. From 13:00 to 14:00, based on the payment documents, BIDV automatically transfers the payable amount from member's deposit account for clearing and settlement (brokerage account and/or proprietary account) to their cash account for clearing and settlement.
15. Based on the payment documents, VSD automatically delivers securities from member's securities accounts pending for settlement (brokerage account and/or proprietary account) into member's securities accounts for clearing and settlement opened at VSD.
16. BIDV sends files and documents to VSD "Report on cash remittance for multilateral netting and payment" from member's deposit account for clearing and settlement to member's cash account for clearing and settlement.
17. From 14:00 to 14:30, based on the payment document, BIDV transfers money (net account payable) from member's cash account for clearing and settlement to VSD's cash account for clearing and settlement.
18. BIDV sends files and documents to VSD "Report on fund transfer for multilateral netting and payment" – from member's cash account for clearing and settlement to VSD's deposit accounts for clearing and settlement.
19. Based on the fund transfer report by BIDV, VSD delivers securities (total net volume receivable) from selling member's securities account for clearing and settlement to VSD's securities accounts for clearing and settlement. VSD and BIDV check and compare the balance in VSD's securities account for clearing and settlement and VSD's deposit account for clearing and settlement with the payment documents.

Note: Description of VIE Business Process Flow Government Bond Market/DVP (2/2)

20. From 14:30 to 14:45, based on the payment documents, BIDV automatically transfers money (total net value receivable) from VSD's deposit account for clearing and settlement to selling member's cash accounts for clearing and settlement.
21. BIDV sends files and documents to VSD's "Report on fund transfer for multilateral netting and payment" – from VSD's deposit account for clearing and settlement to member's cash accounts for clearing and settlement.
22. Based on the fund transfer report by BIDV, VSD delivers securities (total net volume receivable) from VSD's securities account for clearing and settlement to buying member's securities accounts for clearing and settlement.
23. From 14:45 to 15:00, based on the payment documents, the BIDV automatically allocates respective amount from member's cash accounts for clearing and settlement to member's deposit account for clearing and settlement (brokerage account or/and proprietary account) at the BIDV.
24. BIDV sends files and documents to VSD "Report on fund transfer for multilateral netting and payment" from member's cash accounts for clearing and settlement to member's deposit account for clearing and settlement and "Summary report on clearing and payment for cash".
25. Pursuant to the fund transfer report by the BIDV, VSD allocates the respective securities from member's securities accounts for clearing and settlement to member's securities accounts for trading (brokerage accounts and/or proprietary accounts).

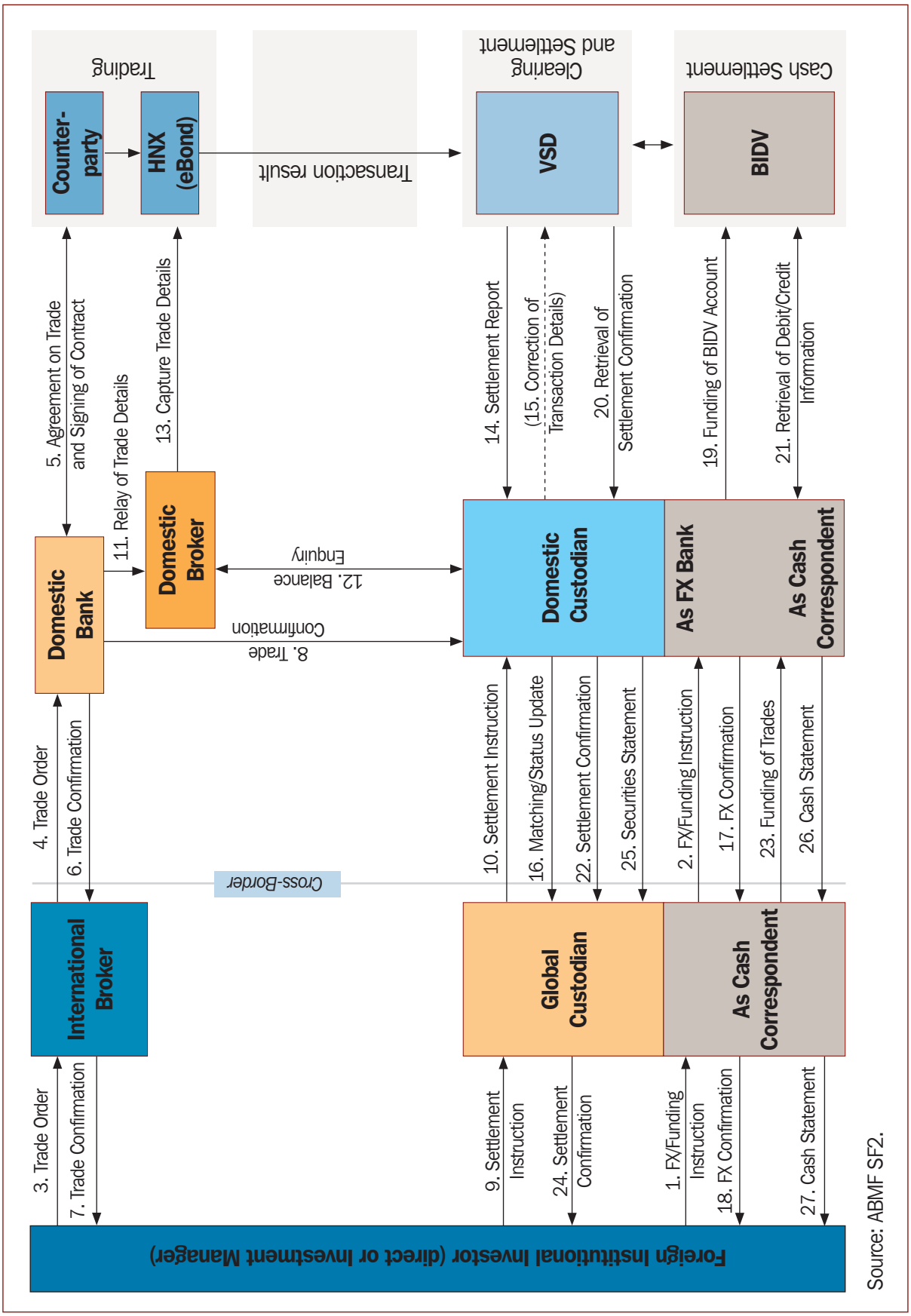
Source: ABMF SF2.

Figure 3. VIE Business Process Flow: Revised Bond Market/DVP



Note: This Transaction Flow simplifies the flowchart of the previous page.
Source: ABMF SF2.

Figure 4. VIE OTC Bond Transaction Flow for Foreign Investors



Source: ABMF SF2.

Note: Description of VIE OTC Bond Transaction Flow for Foreign Investors

T-1

1. Foreign Institutional Investor sends FX/funding instruction to Global Custodian (for planned bond trades).
2. Global Custodian sends FX/funding instruction to Domestic Custodian (to ensure timely availability of VND).
3. Foreign Institutional Investor places order with International Broker.
4. International Broker places order, typically with Domestic Bank.
5. Domestic Broker/Bank trades OTC with Counterparty (via phone), both parties signs trade agreement (contract).
6. Domestic Broker/Bank sends trade confirmation to International Broker.
7. International Broker sends trade confirmation to Foreign Institutional Investor.
8. Domestic Bank sends trade confirmation to Domestic Custodian.
9. Foreign Institutional Investor sends securities settlement instruction to Global Custodian.
10. Global Custodian instructs Domestic Custodian on securities settlement details.
11. Domestic Bank relays trade details to Domestic Broker (as HNX member) for trade capture.

Trade Date

12. Domestic Broker checks available funds/bonds with Domestic Custodian.
13. Domestic Broker captures trade details on HNX, typically via eBond front-end system.
14. VSD provides Settlement Report to Domestic Custodian (at end of "Trade Date").
15. Only in the event of a discrepancy, does Domestic Custodian need to contact VSD (hence dashed arrow).
16. Domestic Custodian provides settlement/matching status to Global Custodian.
17. Domestic Custodian sends FX confirmation to Global Custodian.
18. Global Custodian sends FX confirmation to Investor.
19. Domestic Custodian effects funding of BIDV account.
20. After settlement deadline, Domestic Custodian retrieves settlement confirmation from VSD (hardcopy, or online).

Settlement Date/T+1

21. After settlement deadline, Domestic Custodian retrieves cash debit/credit confirmations from BIDV (hardcopy).
22. Domestic Custodian sends settlement confirmation to Global Custodian.
23. Global Custodian effects funding of account with Domestic Custodian, or into FCY nostro account (before end of day).
24. Global Custodian sends settlement confirmation to Foreign Institutional Investor.
25. Domestic Custodian sends securities statement to Global Custodian.
26. Domestic Custodian sends debit/credit information in cash statement to Global Custodian.
27. Global Custodian sends cash statement to Foreign Institutional Investor.

Source: ABMF SF2.

Bond Market Infrastructure Diagram

Figure 1. ASEAN+3 Government Bond Market Infrastructure Diagram