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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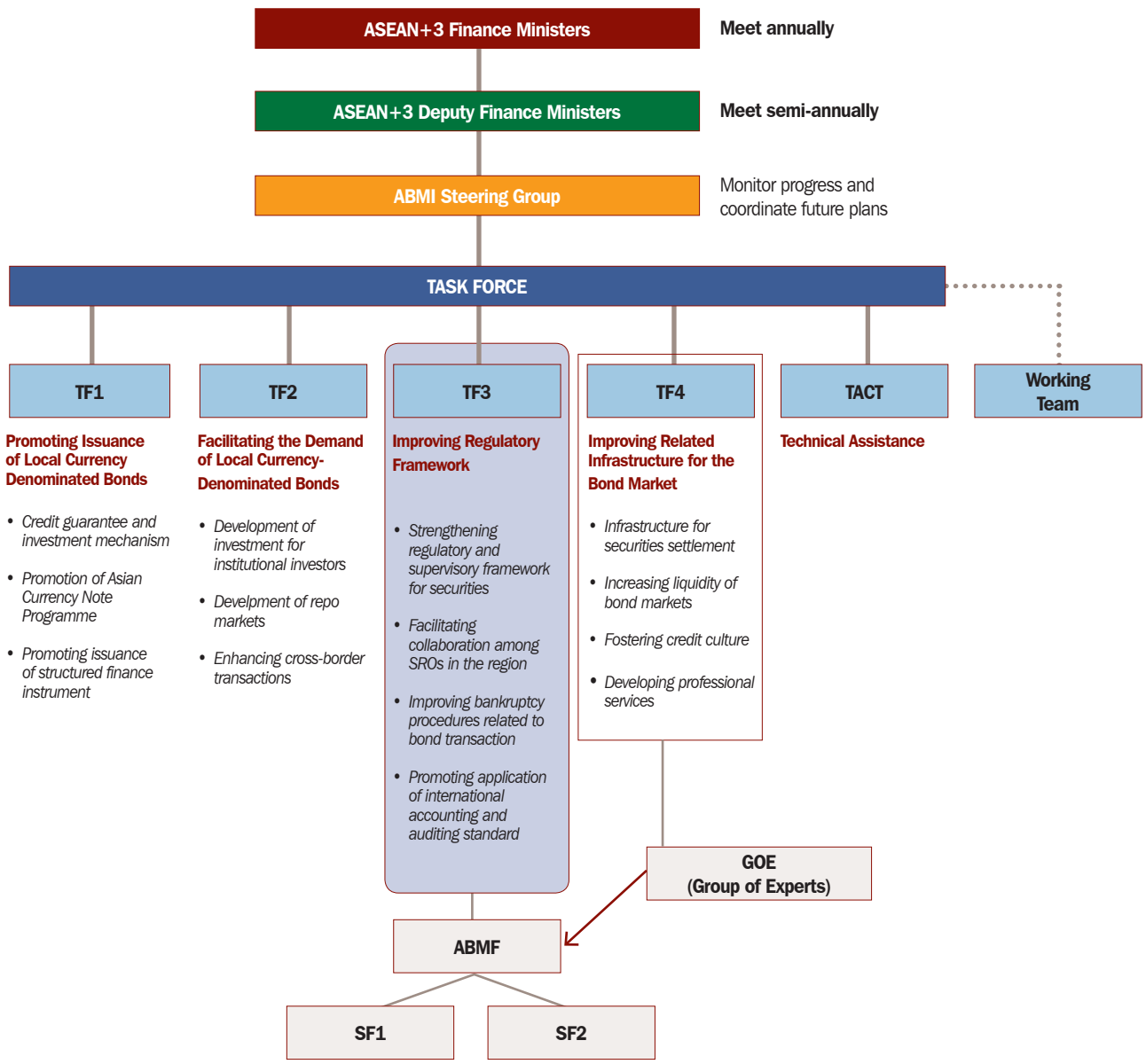
1 The Joint Ministerial Statement of the 13th ASEAN+3 Finance Ministers' Meeting, 2 May 2010, Tashkent, Uzbekistan states that: "We [ASEAN+3 Finance Ministers] took note of the Group of Experts' findings and suggestions on facilitating cross-border bond transactions and settlement, and welcomed the establishment 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	

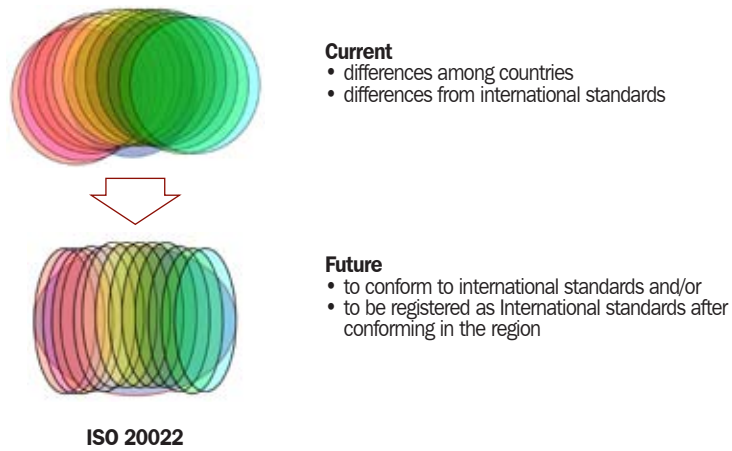
Source: ABMF.

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



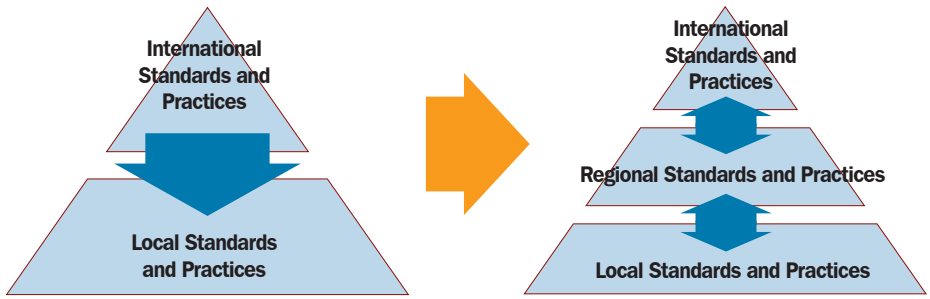
International standards (such as ISO20022) will be the basis for local standards.

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

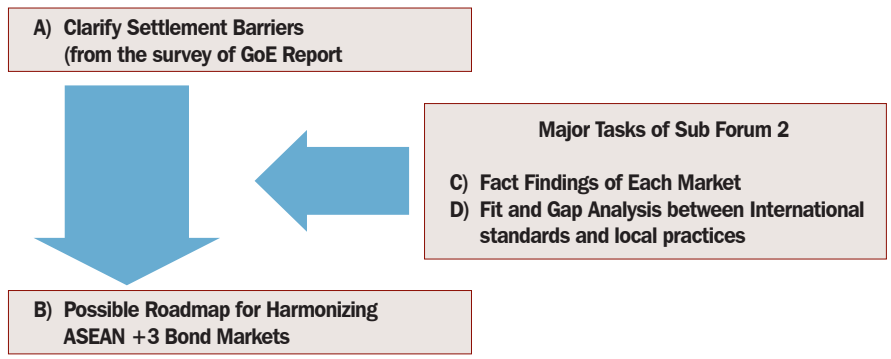


International standards (such as ISO20022) will be the focal point and hub of local standards.

Source: ABMF SF2.

2.2 Methodology Overview

Figure 2.3 Methodology



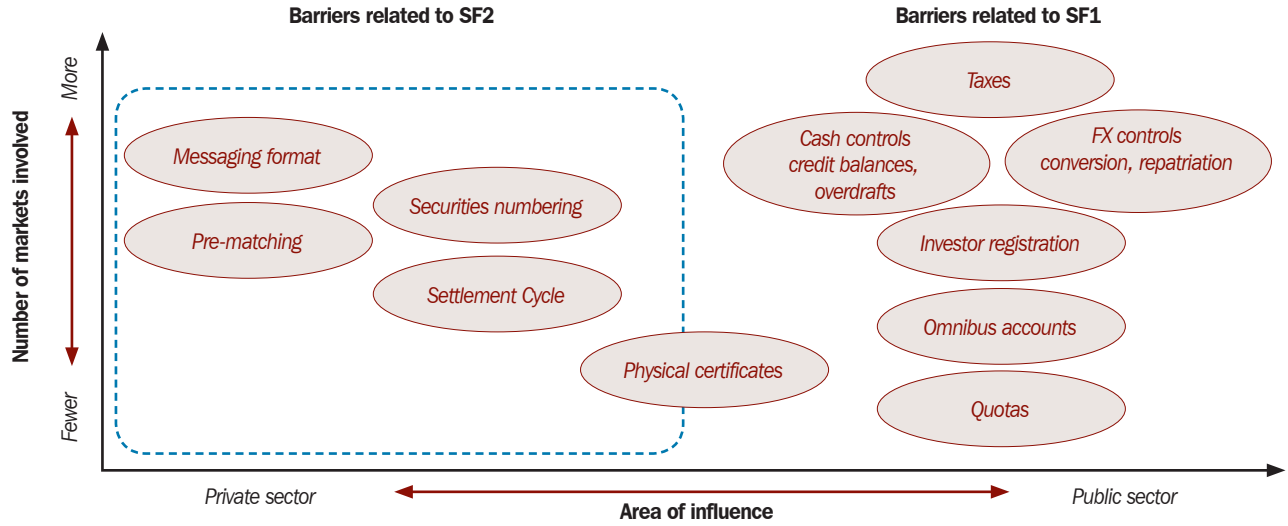
Source: ABMF SF2.

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.

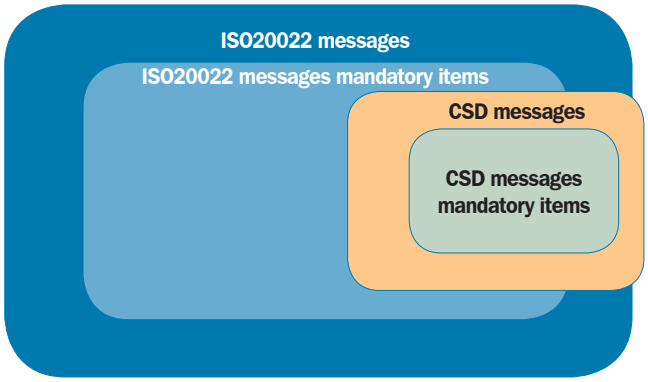
2.5 Fit-and-Gap Analysis

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.

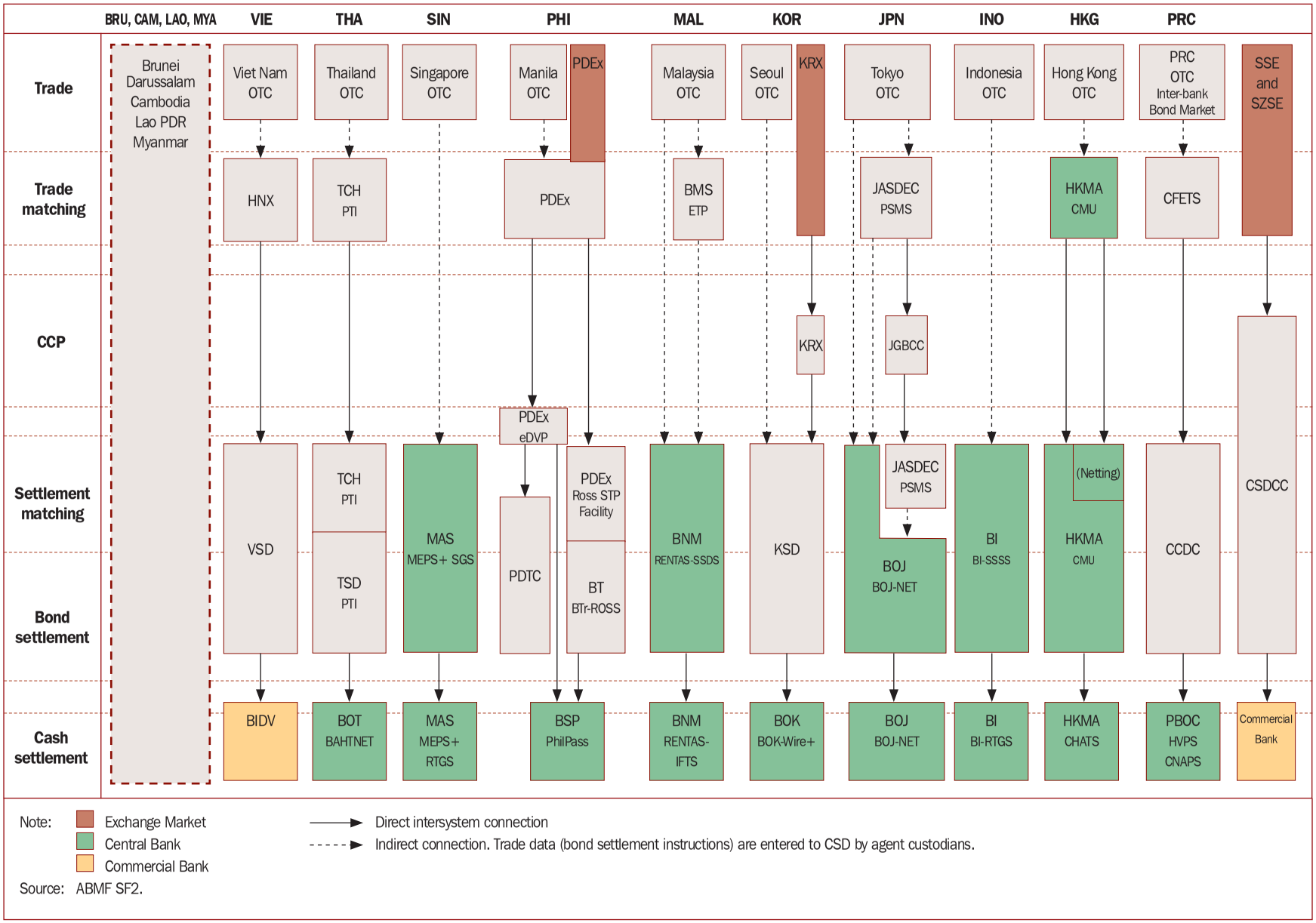
As a preliminary stage of the survey, a fit-and-gap analysis of messages and their flow were conducted. In order to do that, cross-border bond transaction flows and domestic bond transaction flows were surveyed.

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.

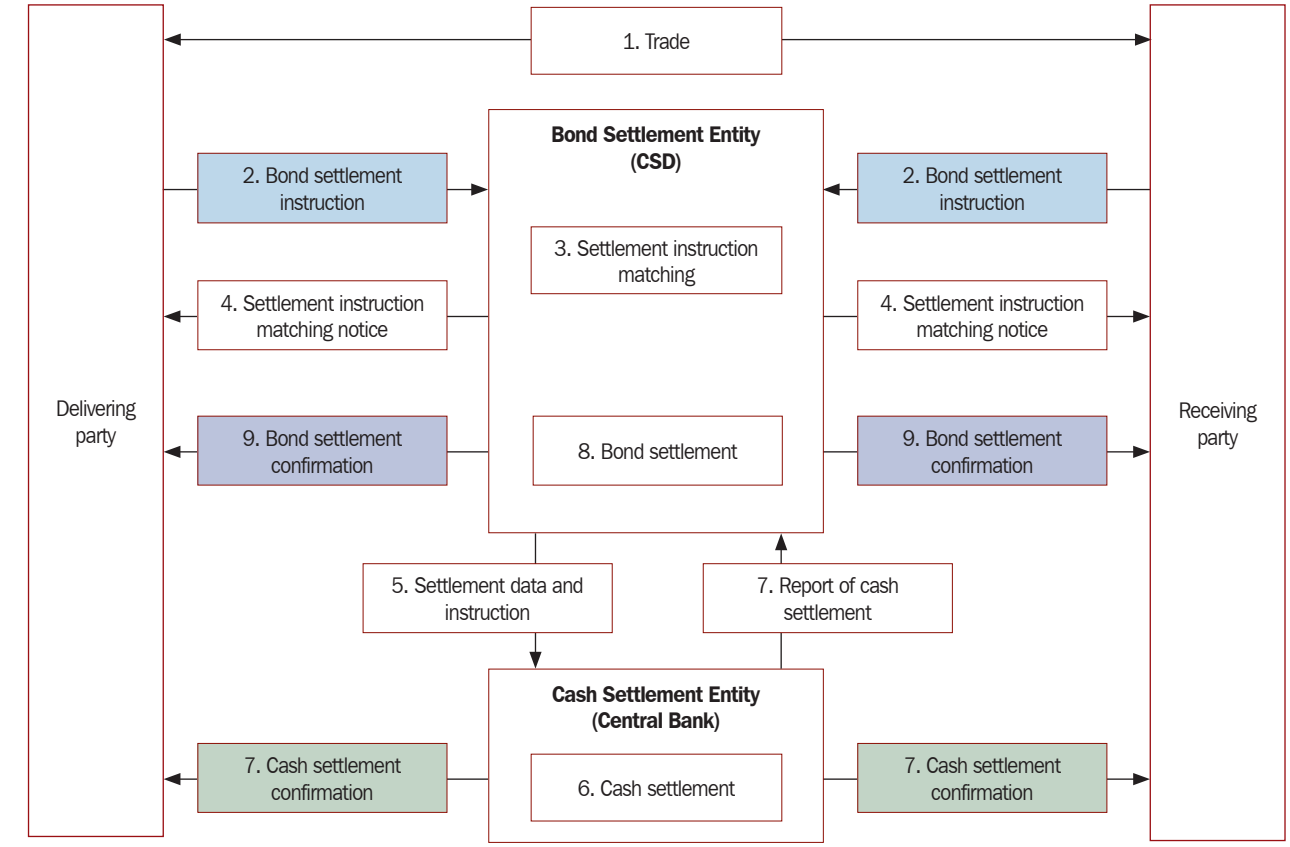
4. Domestic Bond Transaction Flow

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.

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

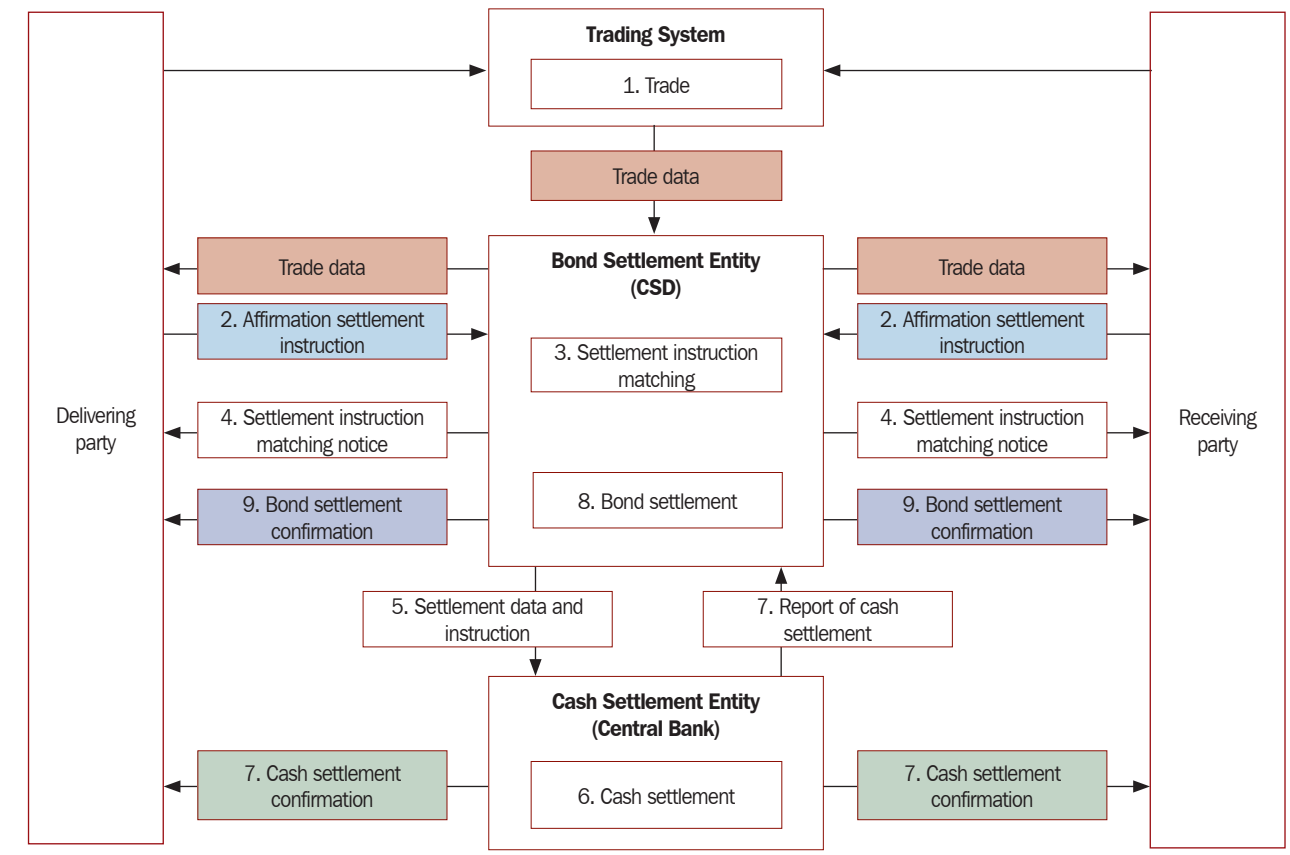
Government bond transaction flows in Hong Kong, Indonesia, Korea (OTC), and Thailand fall into the model flow.

[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)

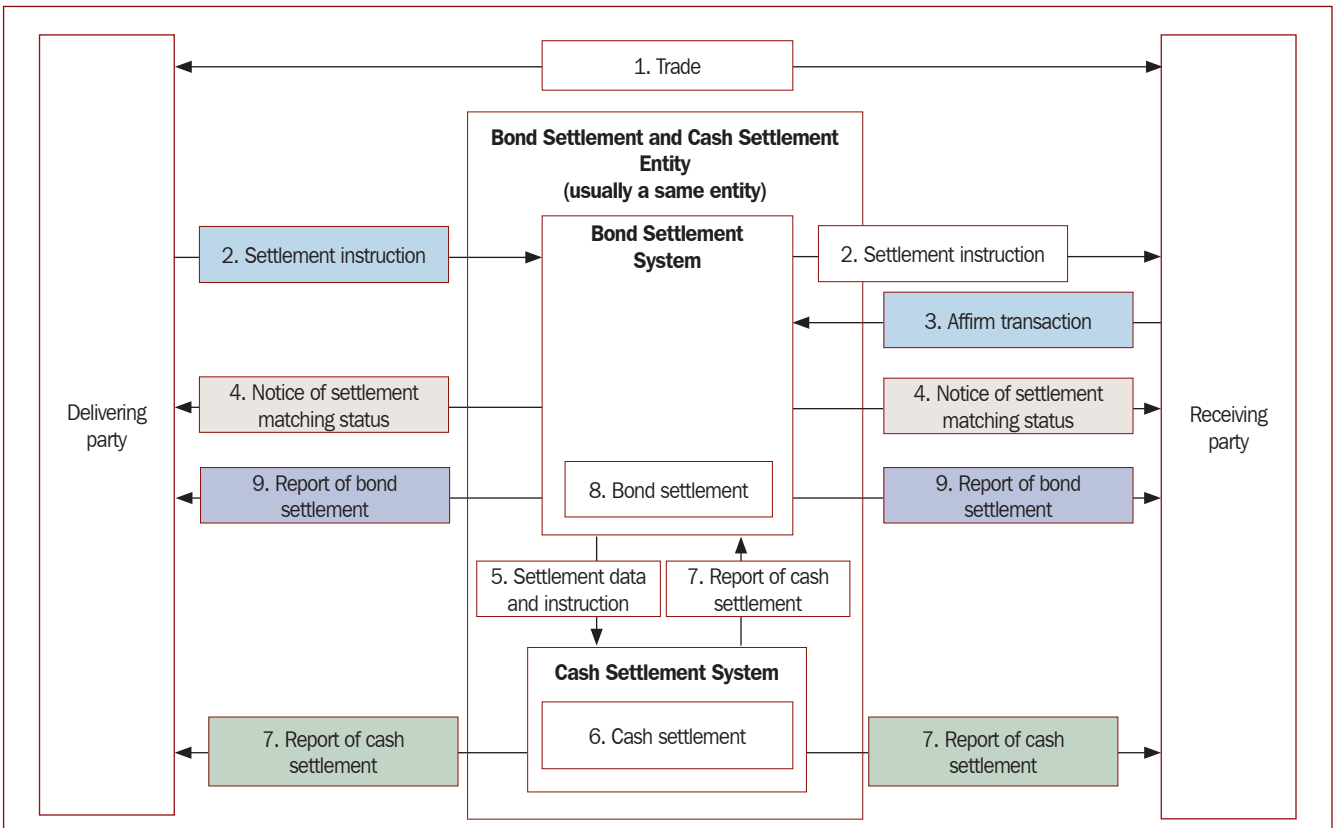


Source: ABMF SF2.

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

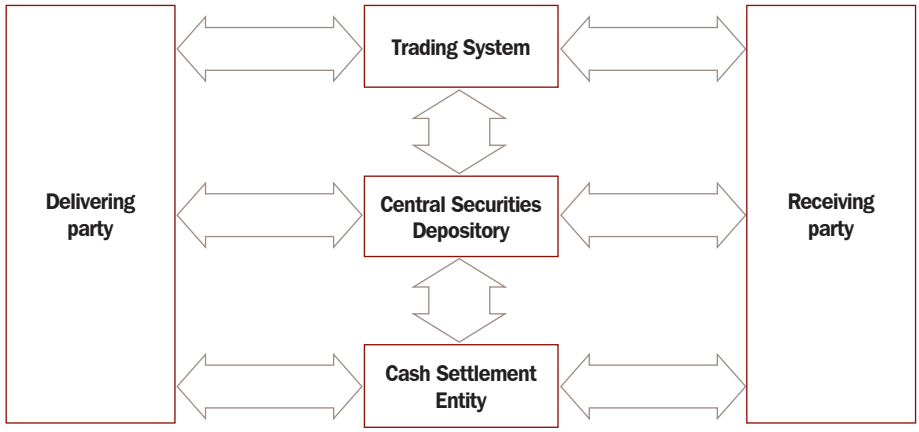
		1. Between CSD and Seller/Buyer			2. Between Cash Settlement System	
	Market	Linkage	Protocol	Message Format	Protocol	Message Format
PRC	OTC	direct link	• TCP/IP • HTTP, SOAP	• XML and Text	• TCP/IP	–
HKG	OTC	direct link	• TCP/IP	• ISO 15022	• TCP/IP	• SWIFT
INO	OTC	terminal access	• SNA. TCP/IP will 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).

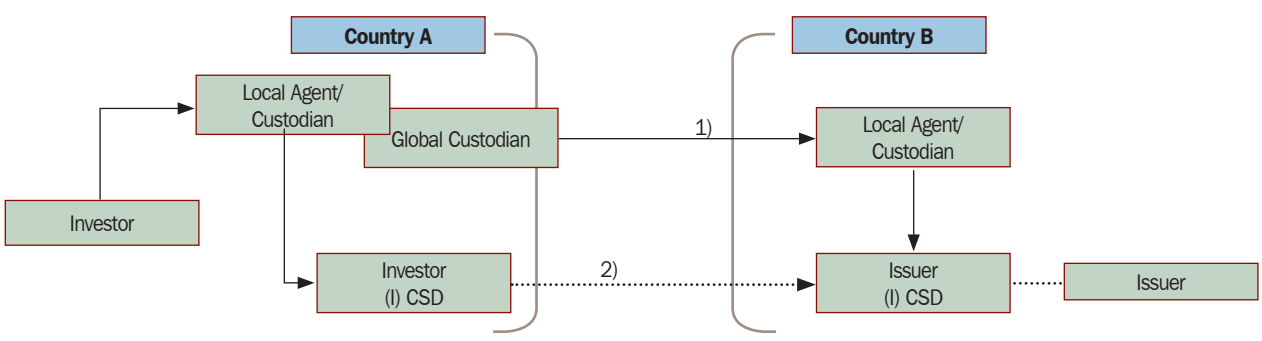
5. Cross-Border Bond Transaction Flow

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



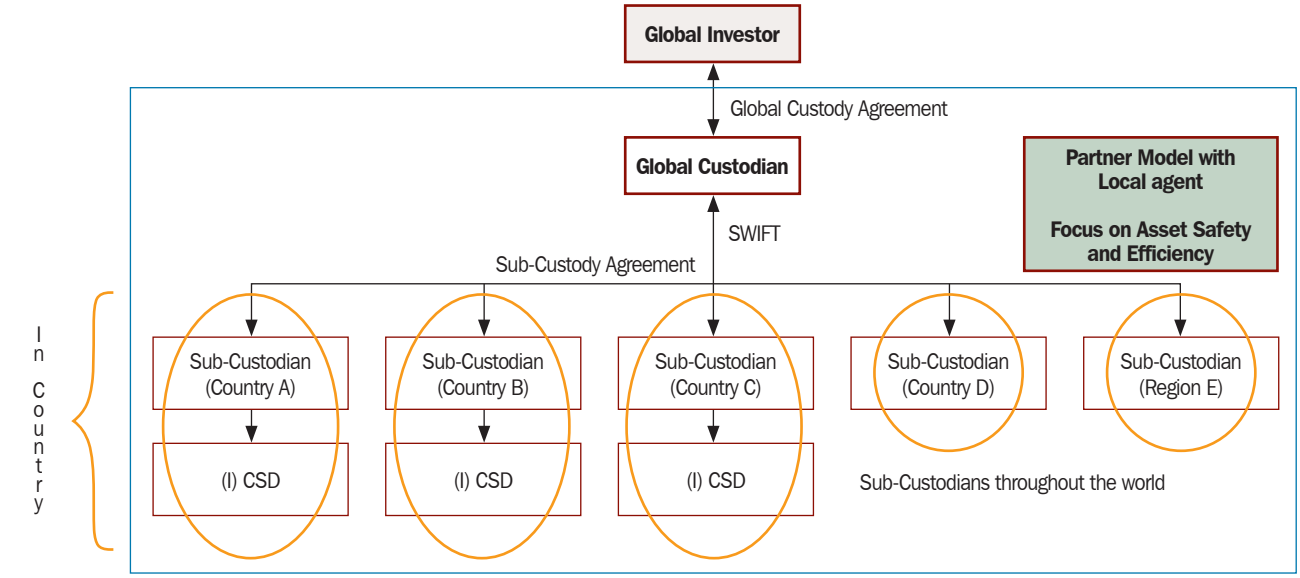
Source: J.P. Morgan.

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

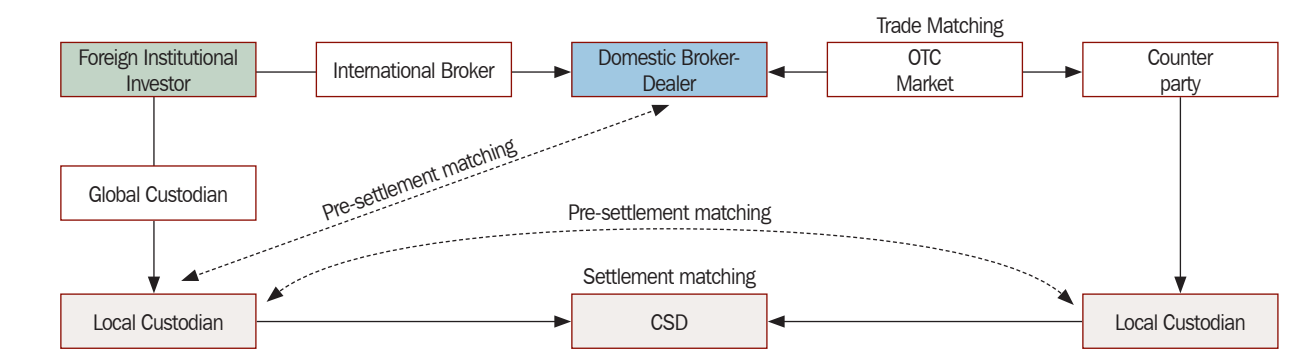
6.1 Matching Categorization

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.

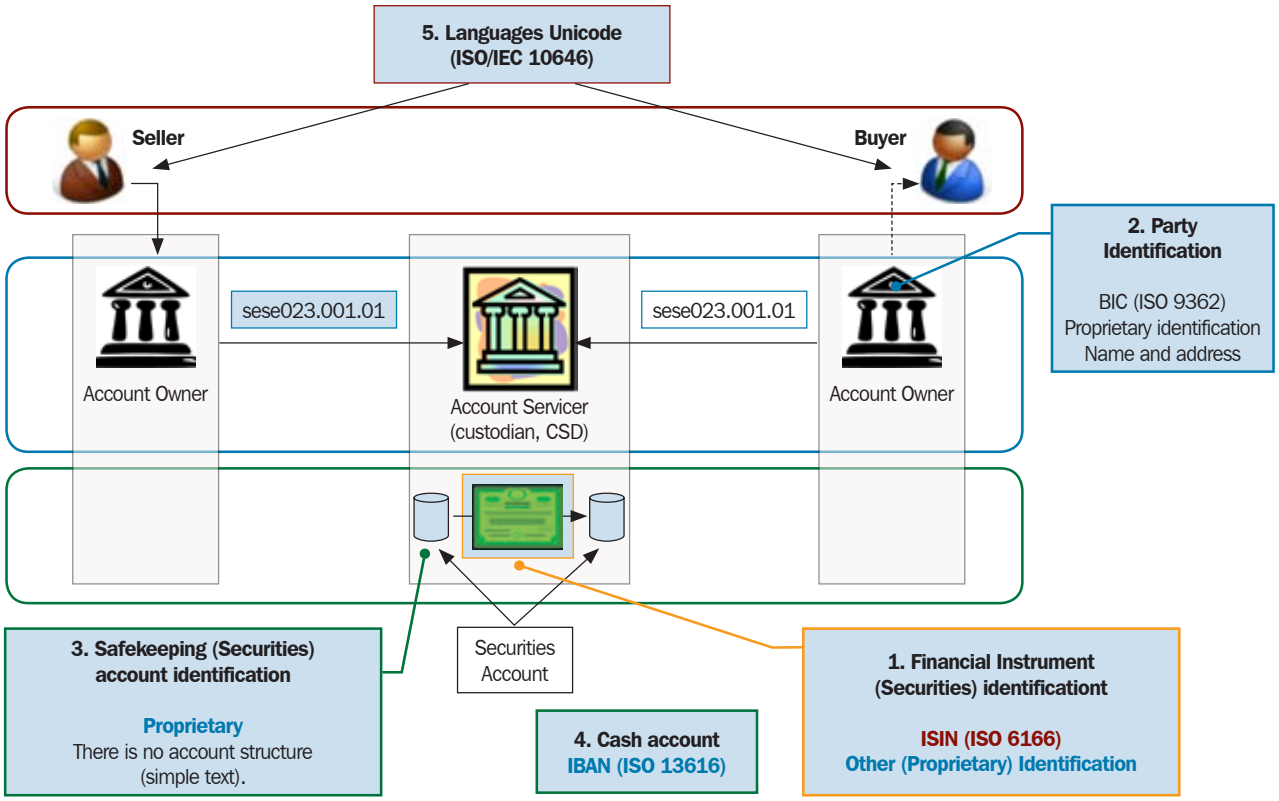
8. Standards on Numbering and Coding

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.

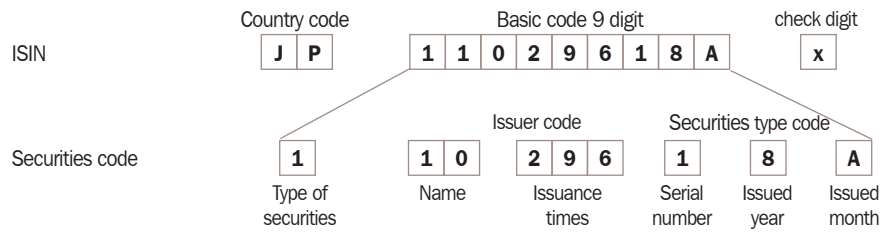
8.2 Securities Numbering

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

Example:	B O J P	J P	J T	X X X
	4 characters for financial institution	2 characters ISO country short name ISO 3166–1 alpha 2	2 characters location code	3 characters branch code, option ('XXX' means head office)

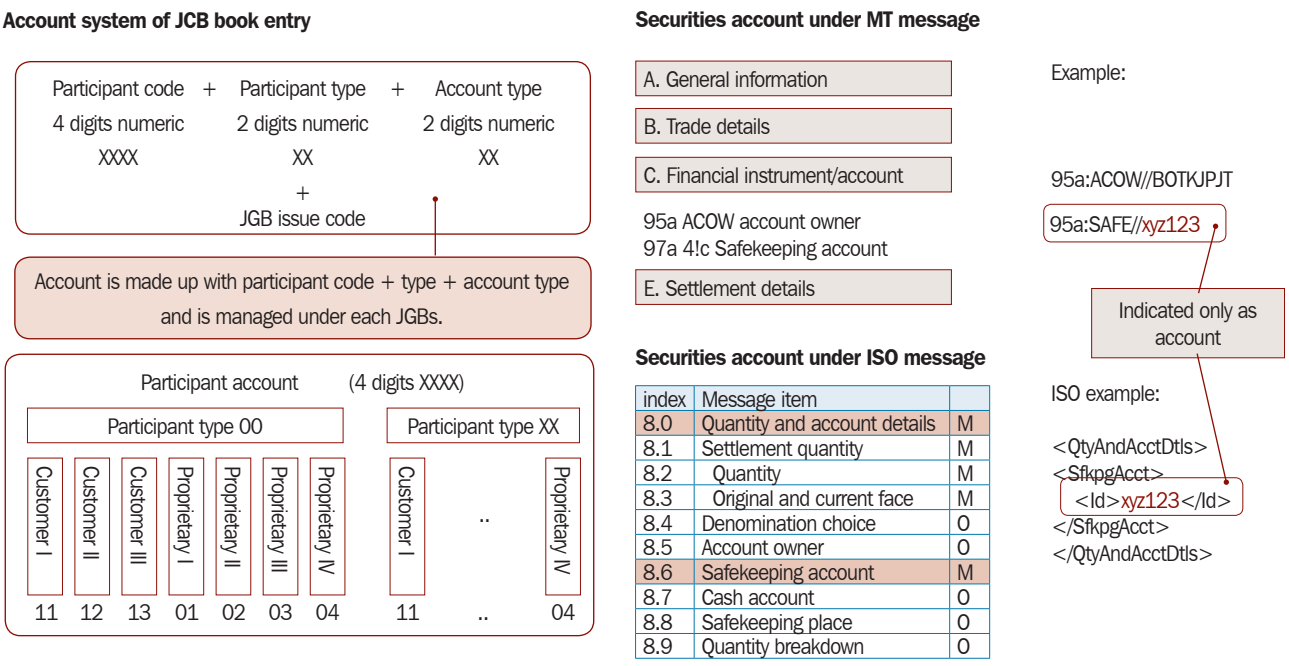
Source: NTT DATA Corporation.

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)

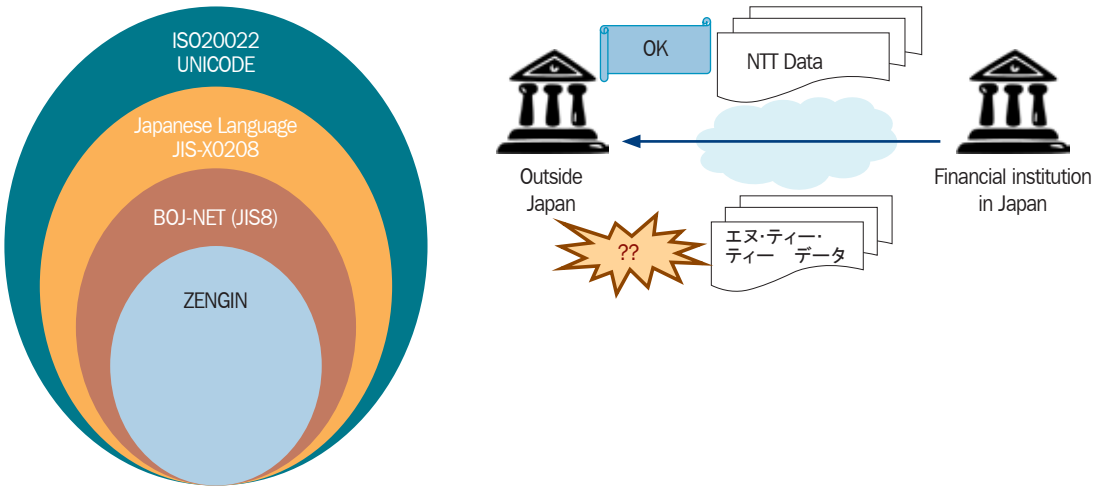


Source: NTT DATA Corporation.

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

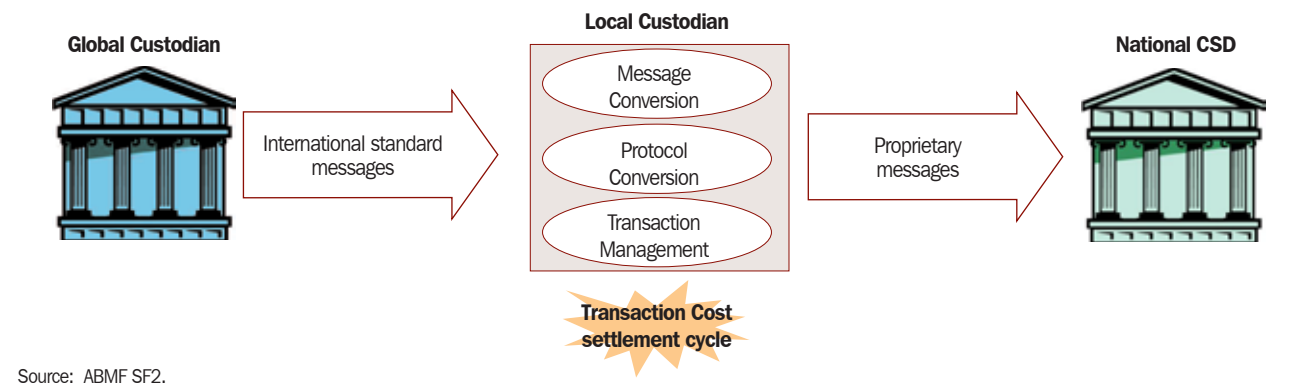
ABMF SF2 envisions that the possible steps listed above will accomplish its purposes. The forum sees it fit to continue the identification of transaction flows, messaging and market practices by expanding its scope from government bonds DVP transactions. The scope of the survey will be expanded to issuance, 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.

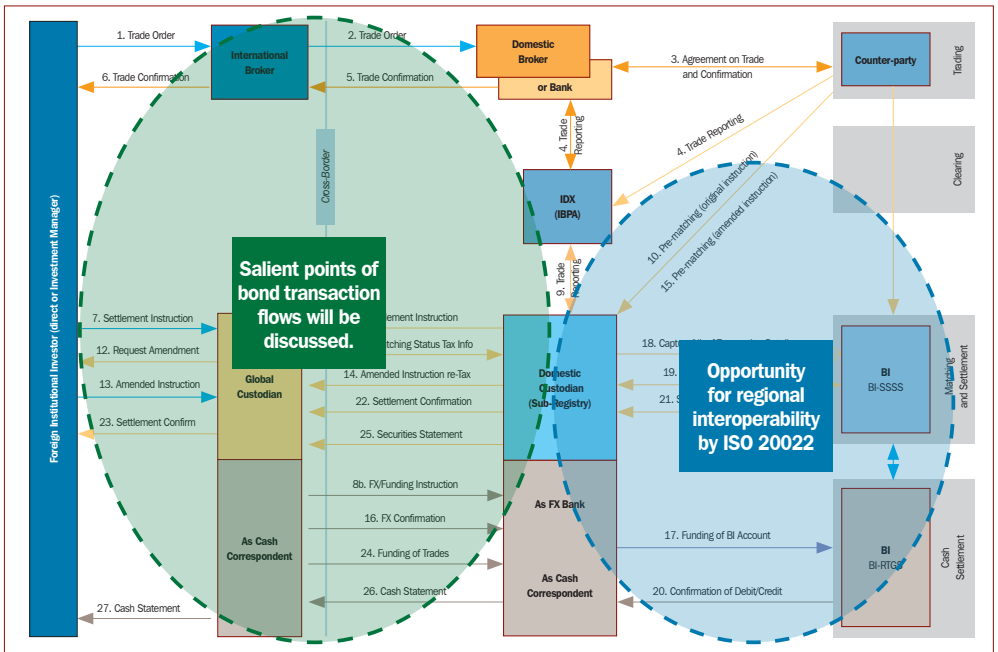
Figure 9.1 Conversion at Local Custodian



Source: ABMF SF2.

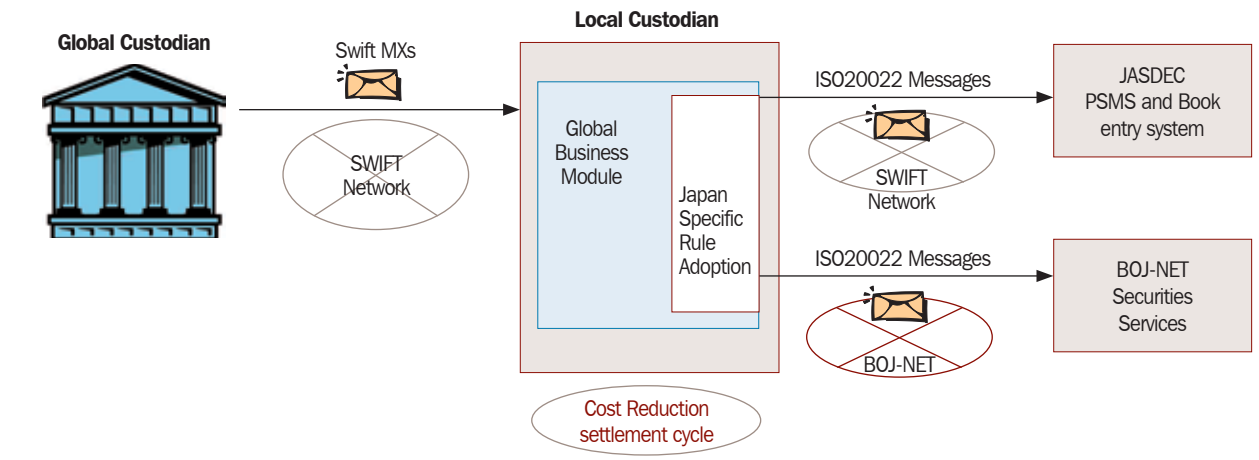
In other words, if the messages of domestic infrastructures become compatible with the international standard, opportunities for regional interoperability will be enhanced. An image of the scope is illustrated in Figure 9.2. More specifically, the adoption of ISO 20022 frameworks will help reduce the 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

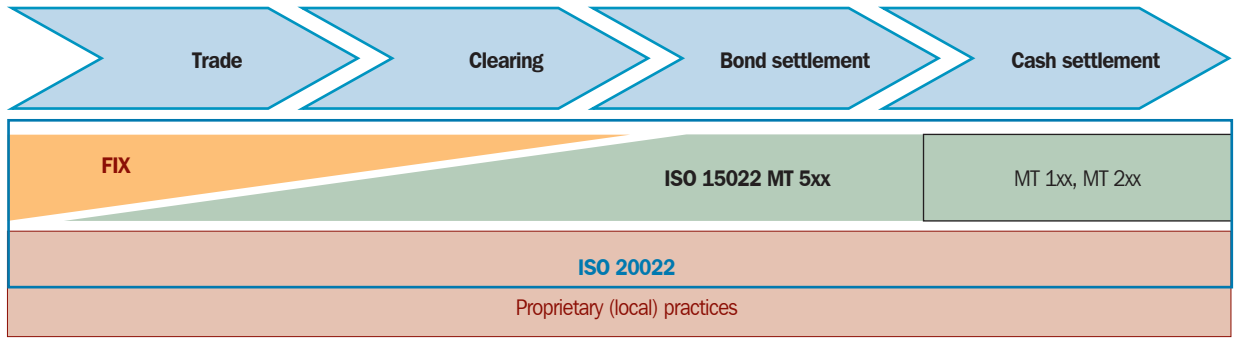


Source: ABMF SF2.

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.

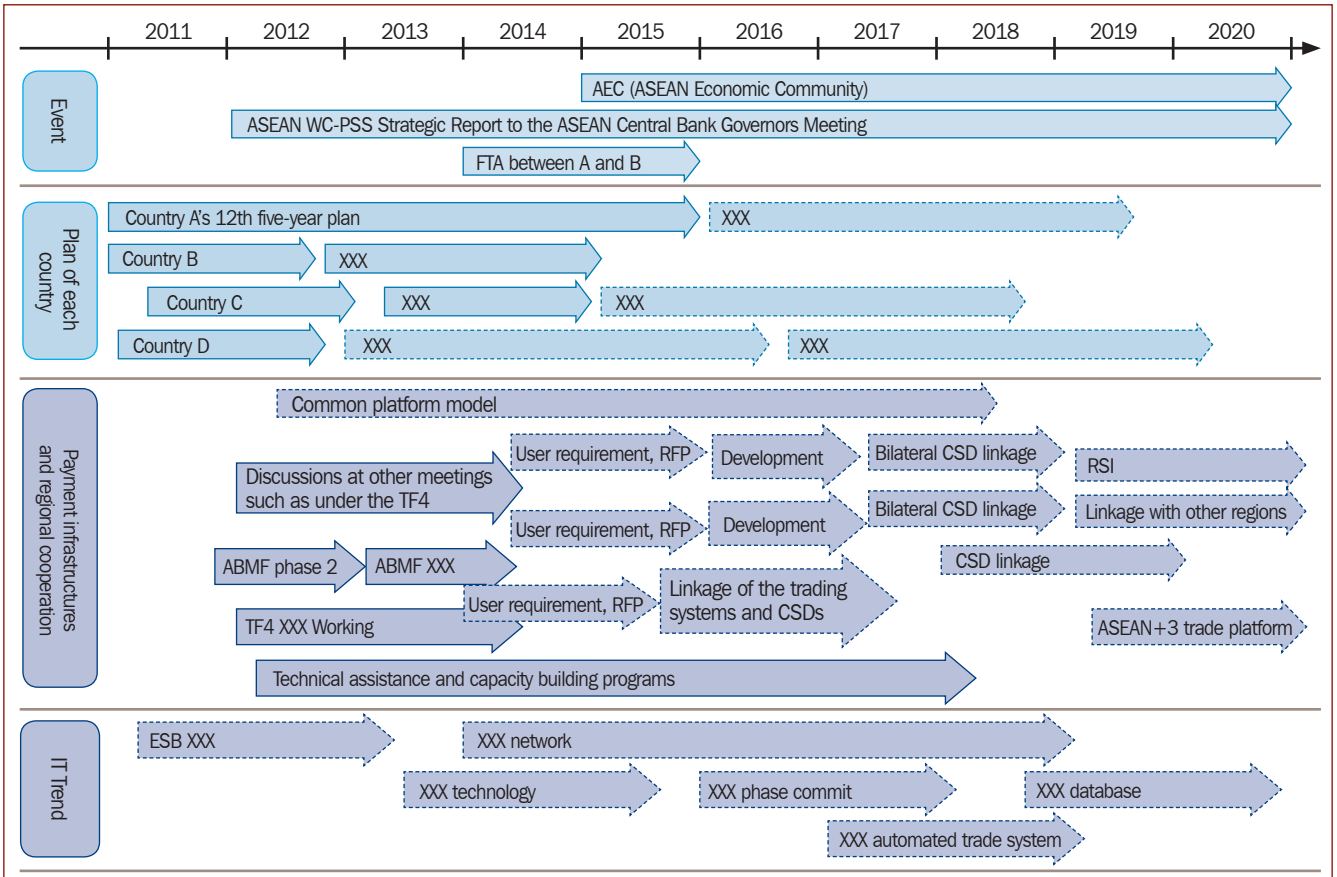
9.3 Drafting Roadmaps

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

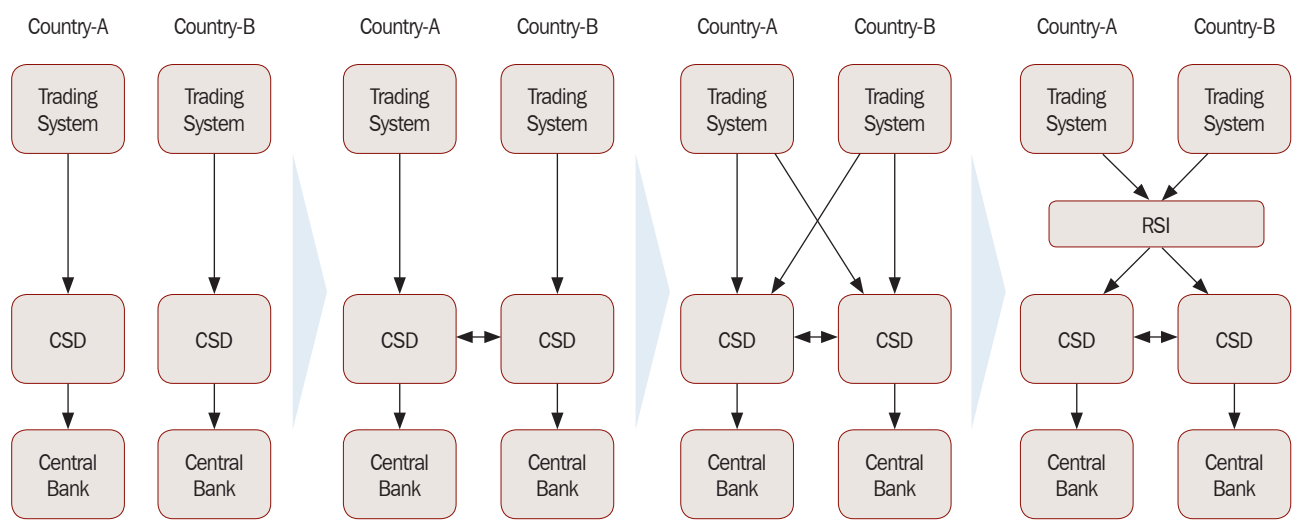


Note: this slide shows just an image and is not based on any realistic facts.
Source: ABMF SF2.

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

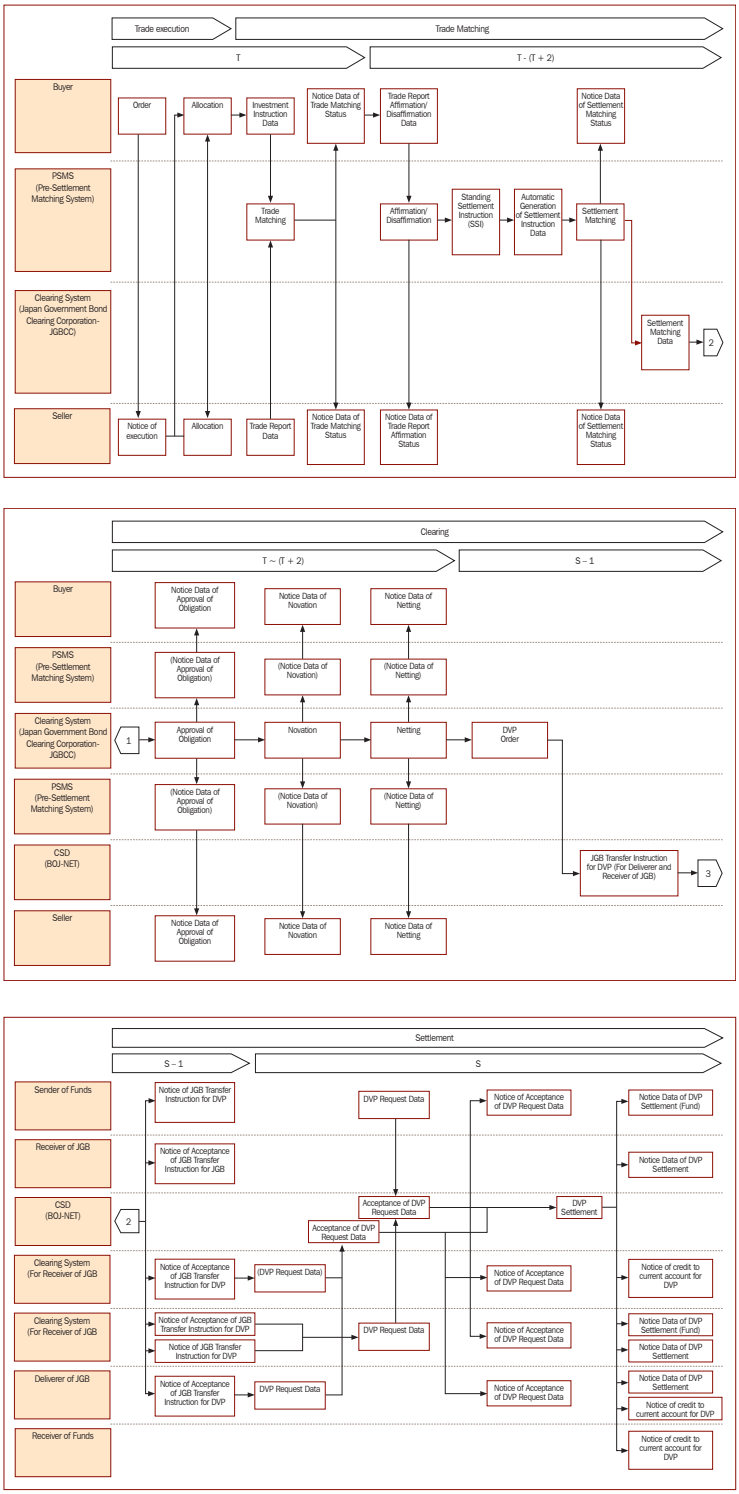


Source: ABMF SF2.

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.

[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?

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Thank you very much for your kind cooperation.

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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					
2.6.1 Name of the Network	2.6.2 Type of Lines	2.6.3 Protocol	2.6.4 Interface	2.6.5 Message Format	2.7 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)*

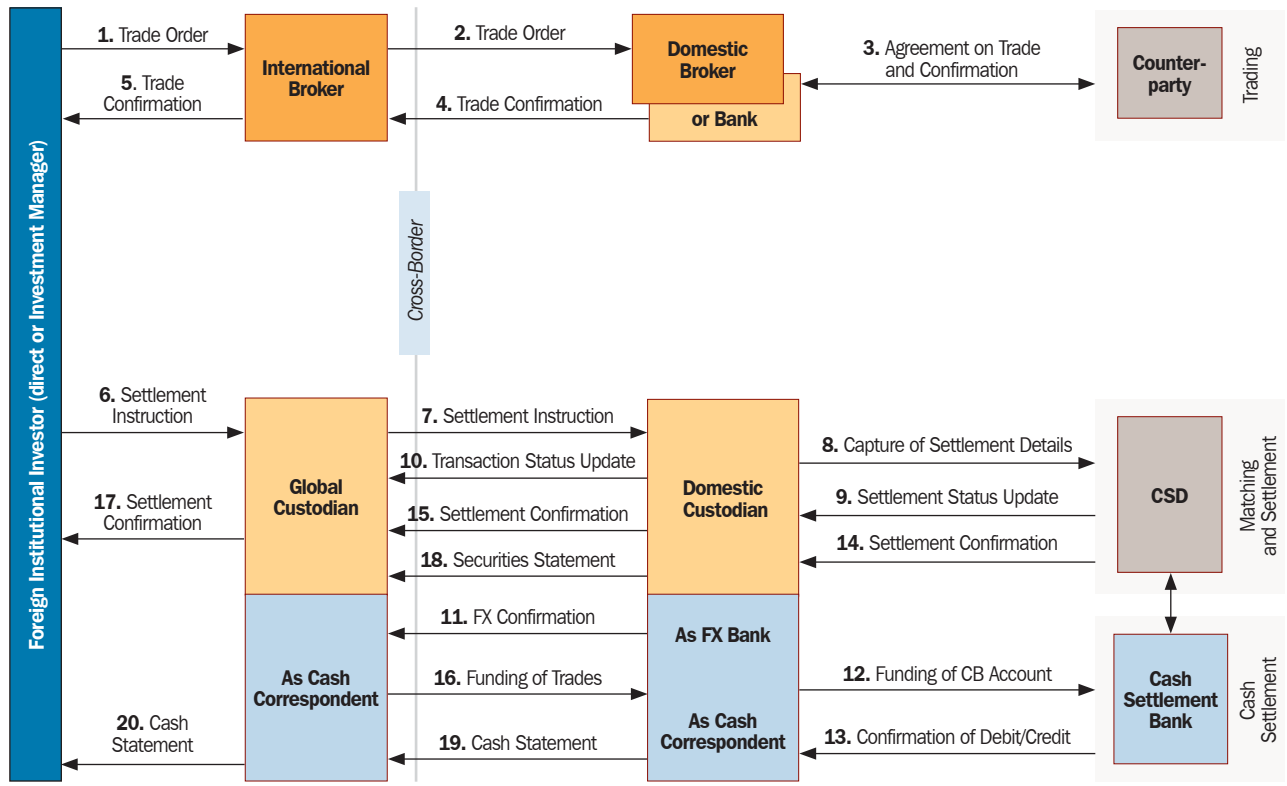
6.3 Securities Account		6.4 Cash Account				6.5 Character Code and Language		
6.3.3 Account Identification	6.3.4 Manual Operations	6.4.1 Use of IBAN code	6.4.2 Other Coding Schemes	6.4.3 BBAN	6.4.4 Manual Operations	6.5.1 Use of Unicode	6.5.2 Other Coding Schemes	6.5.3 Opinion for Standard Language
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
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