



PROGRESS REPORT ON ESTABLISHING A REGIONAL SETTLEMENT INTERMEDIARY AND NEXT STEPS

Implementing Central Securities
Depository–Real-Time Gross Settlement
Linkages in ASEAN+3

CROSS-BORDER SETTLEMENT INFRASTRUCTURE FORUM

PROGRESS REPORT ON ESTABLISHING A REGIONAL SETTLEMENT INTERMEDIARY AND NEXT STEPS

Implementing Central Securities
Depository–Real-Time Gross Settlement
Linkages in ASEAN+3

CROSS-BORDER SETTLEMENT INFRASTRUCTURE FORUM

May 2015



Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO)

© 2015 Asian Development Bank

6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 632 4444; Fax +63 2 636 2444
www.adb.org; openaccess.adb.org

Some rights reserved. Published in 2015.
Printed in the Philippines.

ISBN 978-92-9254-931-2 (Print), 978-92-9254-932-9 (e-ISBN)
Publication Stock No. RPT157241-2

Cataloging-In-Publication Data

Asian Development Bank.

Progress report on establishing a regional settlement intermediary and next steps: Implementing central securities depository–real-time gross settlement linkages in ASEAN+3—Cross-border settlement infrastructure forum. Mandaluyong City, Philippines: Asian Development Bank, 2015.

- | | | | |
|--------------------------------|----------------------------|-----------------------------------|-------------------------------------|
| 1. Settlements. | 2. ASEAN+3. | 3. Asian Bond Markets Initiative. | 4. Central securities depositories. |
| 5. Real-time gross settlement. | I. Asian Development Bank. | | |

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

ADB does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use. The mention of specific companies or products of manufacturers does not imply that they are endorsed or recommended by ADB in preference to others of a similar nature that are not mentioned.

By making any designation of or reference to a particular territory or geographic area, or by using the term “country” in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <https://creativecommons.org/licenses/by/3.0/igo/>. By using the content of this publication, you agree to be bound by the terms of said license as well as the Terms of Use of the ADB Open Access Repository at openaccess.adb.org/termsfuse

This CC license does not apply to non-ADB copyright materials in this publication. If the material is attributed to another source, please contact the copyright owner or publisher of that source for permission to reproduce it. ADB cannot be held liable for any claims that arise as a result of your use of the material.

Attribution—In acknowledging ADB as the source, please be sure to include all of the following information:

Author. Year of publication. Title of the material. © Asian Development Bank [and/or Publisher].
<https://openaccess.adb.org>. Available under a CC BY 3.0 IGO license.

Translations—Any translations you create should carry the following disclaimer:

Originally published by the Asian Development Bank in English under the title [title] © [Year of publication] Asian Development Bank. All rights reserved. The quality of this translation and its coherence with the original text is the sole responsibility of the [translator]. The English original of this work is the only official version.

Adaptations—Any translations you create should carry the following disclaimer:

This is an adaptation of an original Work © Asian Development Bank [Year]. The views expressed here are those of the authors and do not necessarily reflect the views and policies of ADB or its Board of Governors or the governments they represent. ADB does not endorse this work or guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use.

Please contact OARsupport@adb.org or publications@adb.org if you have questions or comments with respect to content, or if you wish to obtain copyright permission for your intended use that does not fall within these terms, or for permission to use the ADB logo.

Note: In this publication, “\$” refers to US dollars.

Contents

Tables and Figures	iv
Acknowledgments	v
Statement from from the Chairs of the Cross-Border Settlement Infrastructure Forum	vi
Executive Summary	vii
Abbreviations	viii
Introduction	1
CSD–RTGS Linkages Model	3
Basic Principles on Establishing a Regional Settlement Intermediary	3
Types of CSD–RTGS Linkages and Their Prioritization	3
Outline of Desktop Study	5
Processing Flow	5
Messages between the Central Securities Depository and the Real-Time Gross Settlement Systems	7
Operating Hours	9
Contingency Measures	9
Policy Recommendations and Road Map	11
Remaining Challenges and Next Steps	13
Appendixes	
1 Members and Observers of the Cross-Border Settlement Infrastructure Forum and the ADB Secretariat (to be revised)	15
2 Outlines of CSD–RTGS Linkages	17
3 Presentations at the Cross-Border Settlement Infrastructure Forum Meetings	21

Tables and Figures

Tables

1	Cross-Currency Delivery Versus Payment Settlement Processes	6
2	Message (pacs.009) Items for Cash Settlement Information from Bank of Japan Financial Network System to Hong Kong Dollar Clearing House Automated Transfer System	8
3	Message (pacs.002) Items for Cash Settlement Status from Hong Kong Dollar Clearing House Automated Transfer System to Bank of Japan Financial Network System	8
4	Cut-Off Time for Cross-Currency Delivery Versus Payment between the Bank of Japan and the Hong Kong Monetary Authority	9
5	Contingency Cases	10

Figures

1	Cross-Currency Delivery Versus Payment Settlement (Japanese Government Bond-Hong Kong Dollars)	6
2	Road Map for Establishing a Regional Settlement Intermediary in ASEAN+3	12
A2.1	Cross-Border CSD Linkage with Domestic Delivery Versus Payment	18
A2.2	CSD-RTGS Linkages for Cross-Currency Delivery Versus Payment	19
A2.3	RTGS-RTGS Linkages for Payment Versus Payment	20

Acknowledgments

The Asian Development Bank (ADB) Secretariat thanks the chair and vice-chair for guiding discussions to fruitful results.

The members and observers of the Cross-Border Settlement Infrastructure Forum (CSIF) provided inputs by instructing the activities and commenting on the desktop study jointly conducted by the Bank of Japan–Hong Kong Monetary Authority at various meetings and visits, and reviewing the draft thoroughly.

The BOJ and the HKMA have contributed to the development of the cross-currency delivery versus payment model through the desktop study. The advice from the People's Bank of China and the China Central Depository & Clearing on the messages between the central securities depository (CSD) and the real-time gross settlement (RTGS) systems helped the ADB consultant for the CSIF to make a preliminary proposal of messages and their items for further discussion. Bank Indonesia, Bank Negara Malaysia, and Bank of Thailand also helped the team to develop, on a preliminary basis, standard messages for the CSD–RTGS linkages. In the Republic of Korea, the Bank of Korea, the Korea Securities Depository, and the Ministry of Strategy and Finance supported the ADB Secretariat to develop the road map of the CSD–RTGS linkages.

Therefore, the report should be regarded as a crystallization of regional collaborative efforts and knowledge toward more harmonized and integrated ASEAN+3 bond markets through CSIF activities. Without strong support and cooperation from CSIF members and observing authorities in the region this report would not have been published.

This report does not represent the official views of ADB or any of the institutions that participated as CSIF members and observers. The ADB consultant for the CSIF prepared the contents of this report.

The ADB Secretariat, particularly the ADB consultant for CSIF, expresses heartfelt gratitude to CSIF members and observers.

Statement from the Chairs of the Cross-Border Settlement Infrastructure Forum

The chair and vice-chair express their heartfelt gratitude to members and observers of the Cross-Border Settlement Infrastructure Forum (CSIF) for their contributions toward the success of this initiative. The chair and vice-chair look forward to receiving continuous support from members and observers as this report represents the planning stage before the CSIF objectives are implemented. The chairs greatly appreciate the support of the Asian Development Bank (ADB) Secretariat, including the ADB consultant for the CSIF for drafting the report.

Bella S. Santos

Chair, Cross-Border Settlement Infrastructure Forum
Director, Payments and Settlements Office
Bangko Sentral ng Pilipinas

Jong-Hyung Lee

Vice-Chair, Cross-Border Settlement Infrastructure Forum
Team Head, International Relations and Planning Team
Korea Securities Depository

Executive Summary

The Asian Bond Markets Initiative Task Force 4 has conducted several studies on a regional settlement intermediary. The Cross-Border Settlement Infrastructure Forum (CSIF) was established after being endorsed in May 2013 in Delhi at the meeting of Finance Ministers and Central Bank Governors of the Association of Southeast Asian Nations (ASEAN), the People's Republic of China, Japan, and the Republic of Korea—collectively known as ASEAN+3.

Central securities depository (CSD)–real-time gross settlement (RTGS) linkages can be categorized into three types: (i) CSD–CSD linkages (cross-border CSD linkages with domestic delivery versus payment [DVP]), (ii) CSD–RTGS linkages for cross-currency DVP, and (iii) RTGS–RTGS linkages for payment versus payment.

Standard messages connecting the CSD and the RTGS systems to effect cross-currency DVP settlement on a preliminary basis are proposed for further discussion. International standards, in particular ISO 20022, have been adopted.

This report contains a road map to implement the CSD–RTGS linkages by 2020. It also discusses the possibility of developing an integrated solution connecting each market's infrastructure with a hub after completing the linkages. The long-term goals of the CSIF are (i) deeper and more liquid bond markets in ASEAN+3 economies, (ii) government debt treated as an asset in ASEAN+3 economies, and (iii) interoperability of CSD–RTGS linkages not only within ASEAN+3 but also with other regions.

The remaining challenges for CSIF members interested in establishing the CSD–RTGS linkages for DVP settlement of cross-currency repo include (i) pursuing further study of planning and development of linkage interfaces; and (ii) agreeing on essential matters such as normal and contingency operational arrangements. Further, to support expansion of bilateral CSD–RTGS linkages in ASEAN+3, the CSIF would identify implementation challenges, including legal barriers and market-practice-related impediments.

Next steps include (i) exchanging message items between the CSD and the RTGS systems, with cross-currency DVP standardized based on the results of a desktop study by the Bank of Japan and the Hong Kong Monetary Authority that incorporates the ISO 20022 message definition report; (ii) discussing messages for the CSD–CSD linkages and the RTGS–RTGS linkages for payment-versus-payment settlement to standardize them based on ISO 20022 messages by utilizing the experiences of the desktop study; and (iii) identifying and discussing essential user requirements other than the ISO 20022 messages.

Abbreviations

ASEAN	Association of Southeast Asian Nations
BOJ	Bank of Japan
CHATS	Clearing House Automated Transfer System
CSD	central securities depository
CSIF	Cross-Border Settlement Infrastructure Forum
DVP	delivery versus payment
HKMA	Hong Kong Monetary Authority
ISO	International Organization for Standardization
JGB	Japanese Government Bond
RSI	regional settlement intermediary
RTGS	real-time gross settlement
PVP	payment versus payment

Introduction

In Delhi in May 2013, the Finance Ministers and Central Bank Governors of the Association of Southeast Asian Nations (ASEAN), the People's Republic of China (PRC), Japan, and the Republic of Korea—collectively known as ASEAN+3—agreed to set up a Cross-Border Settlement Infrastructure Forum (CSIF) to discuss detailed work plans and related processes for the improvement of cross-border settlement in the region, which included the possibility of establishing a regional settlement intermediary (RSI). Members, observers, and the CSIF Secretariat are listed in Appendix 1.

Based on the intensive discussions among CSIF members, the first report, *Basic Principles on Establishing a Regional Settlement Intermediary and Next Steps Forward*, was published by the Asian Development Bank in May 2014 after being endorsed by the ASEAN+3 finance ministers and Central Bank governors at their 17th meeting held in May 2014 in Astana. The members agreed that the central securities depository (CSD)–real-time gross settlement (RTGS) linkages, which connect national CSD systems and RTGS systems in a flexible way, would be an achievable model for cross-border settlement infrastructure in the short term and medium term. This model linking existing infrastructure enables local bonds to be settled in delivery versus payment (DVP) via central bank money, which ensures the safety of settlement and is compliant with international standards, as well as being cost-efficient. As such, the CSD–RTGS linkages are to be studied as the most feasible model for implementing the RSI in ASEAN+3.

The Joint Statement of the 17th ASEAN+3 Finance Ministers and Central Bank Governors Meeting reads as follows:

We welcomed the recommendations submitted by the Cross-Border Settlement Infrastructure Forum (CSIF) and the direction of developing the implementation roadmap of CSD–RTGS linkages as short-term and medium-term goals and integrated solution as a long-term goal for making it possible to deliver securities smoothly and safely versus payment across borders. We are of the view that this is a practical and efficient approach to advance regional settlement infrastructure that promotes cross-border securities transactions in the region.

The 4th and 5th CSIF meetings were held in Hong Kong, China (September 2014) and Manila (January 2015), respectively. Specific topics to develop an implementation plan for the CSD–RTGS linkages—such as a desktop study, possible road map—were discussed at these meetings. As an initial step, the Bank of Japan (BOJ) and the Hong Kong Monetary Authority (HKMA) agreed to conduct a desktop study.

This report aims to present the desktop study results and a possible road map that includes next steps forward.

CSD–RTGS Linkages Model

Basic Principles on Establishing a Regional Settlement Intermediary

Based on previous discussions, including the first report, *Basic Principles on Establishing a Regional Settlement Intermediary and Next Steps Forward*, the following basic principles on establishing an RSI were reconfirmed.

- (i) **Domesticity and cost efficiency.** Maximize utilization of existing cash and bond settlement infrastructure.
- (ii) **Safety.** As recommended in the Principles for Financial Market Infrastructures, cash settlement should use central bank money where practical and available.
- (iii) **Flexibility.** Allow newcomers to join when the market is reasonably developed and ready.
- (iv) **Accessibility.** Structure so that small and medium-sized local financial institutions can benefit (not just for the benefit of major and global players).
- (v) **Gradual integration.** Start from bilateral links. Explore the possibility of centralized integration as long-term goal.
- (vi) **Consistency and collaboration with other initiatives.** Explore greater benefits by maintaining consistency and collaboration with other initiatives of the region.
- (vii) **Standardization.** Standardize market practices and technical aspects among members as much as possible to minimize costs.
- (viii) **Harmonization of rules and regulations.** Harmonize rules and regulations as much as practical which hinder cross-border transactions as much as possible. Regulations that require holistic policy considerations such as capital controls and taxation are taken as given.

Types of CSD–RTGS Linkages and Their Prioritization

In line with these basic principles, ways of implementing the CSD–RTGS linkages were discussed. The CSD–RTGS linkages were categorized into three types: (i) CSD–CSD linkages, (ii) CSD–RTGS linkages, and (iii) RTGS–RTGS linkages. CSD–CSD linkages connect an issuer CSD and an investor CSD and aim to provide an access channel for

investments in securities in issuer CSDs. CSD–RTGS linkages connect a CSD system in an economy with an RTGS system in another economy and aim to achieve DVP settlement for cross-currency repo or settlement of foreign-currency-denominated bonds. RTGS–RTGS linkages connect two RTGS systems in different economies to achieve payment versus payment (PVP) settlement for foreign exchange transactions. The outlines of the three types of CSD–RTGS linkages are shown in Appendix 2.

CSIF members discussed the prioritization of areas to be studied. They considered the three model linkages and determined which linkage to study and which user requirements to define as the highest priority. They concluded that the CSD–RTGS linkages for cross-currency DVP would be discussed first and given the highest priority based on the following reasons:

- (i) Cross-currency DVP (repo) could support financial institutions in ASEAN+3 economies to obtain foreign currencies liquidity by utilizing bond holding in their own countries as collateral. Cross-currency DVP will also contribute to the objective of the Asian Bond Markets Initiative “to develop efficient and liquid bond markets in Asia.”

Tightened regulations, including the Dodd–Frank Act in the United States and Basel III capital requirements, will be enforced in the coming years. As a result, increased dependency on secured transactions and uneven distribution of high-quality collateral could be issues for global finance. In addition, financial institutions are expanding businesses in Asia, increasing the need to obtain stable foreign currency funding sources.

- (ii) The BOJ and the HKMA conducted a study on CSD–RTGS linkages, and identified essential message formats to be exchanged between the CSD and RTGS systems to effect DVP settlement.

The HKMA offered to share their experience in developing and operating CSD–CSD, CSD–RTGS, and RTGS–RTGS linkages with CSIF members. The HKMA also announced that it will enhance the functions of the Cross-Currency Payment Matching Processor as needed since it has been operating for many years.

Based on the results of the desktop study by the BOJ and the HKMA, interested members will study the CSD–CSD and the RTGS–RTGS linkages. A few typical models will be chosen as candidates for the study. In particular, it may be possible to identify and standardize message items transferred between CSD and CSD, CSD and RTGS, and RTGS and RTGS based on ISO 20022.

Outline of Desktop Study

At the 4th CSIF meeting, the BOJ and the HKMA announced the conduct of a joint study on CSD–RTGS linkages. Taking as an example the cross-border bilateral linkage between the systems of the BOJ and HKMA, the joint study aimed to create a common model for cross-currency DVP linkage in the region, focusing on message flows and formats exchanged between the CSD and the RTGS systems. This study does not intend to standardize the formats and flows of messages exchanged between the CSD–RTGS and its users. That topic falls within the mandate of Sub-Forum 2 of the ASEAN+3 Bond Market Forum.

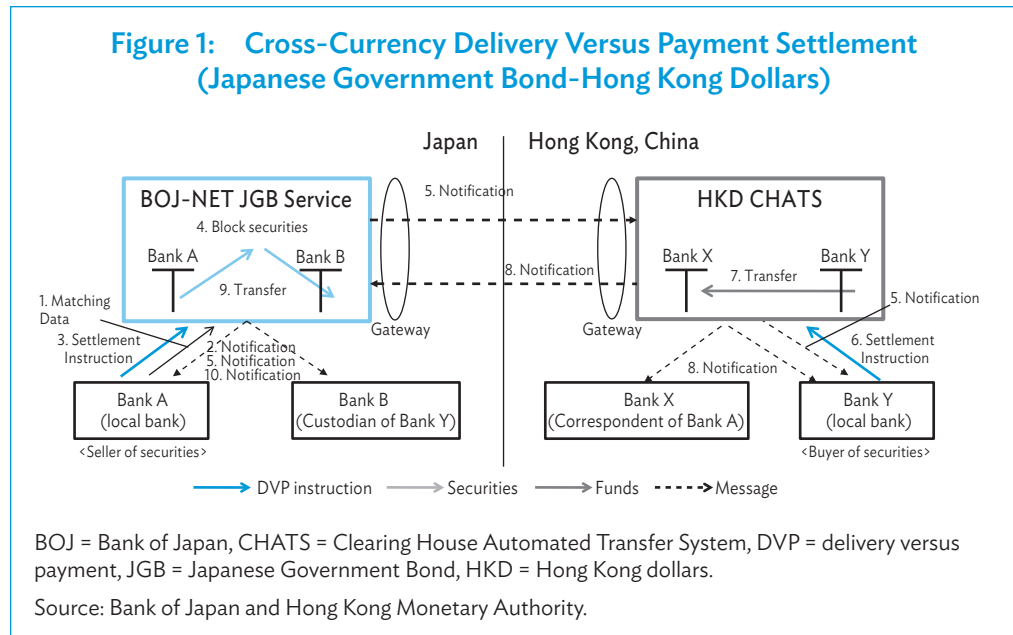
Two linkage options are possible between the BOJ and the HKMA: (i) linking the Hong Kong dollar Clearing House Automated Transfer System (HKD CHATS) with the BOJ-NET Japanese Government Bond (JGB) Services, and (ii) linking the BOJ-NET Funds Transfer System with the HKMA's Central Moneymarkets Unit. The first option was chosen as the model to be studied since the second option is in principle identical from the perspective of message flow, message format, and contingency measures.

At CSIF meetings, it was confirmed that banks in ASEAN+3 will be able to obtain foreign currency via repo transactions. Since banks in each ASEAN+3 economy generally have a sufficient amount of government bonds in the domestic currency, it would be better if banks could utilize the bonds to obtain local currencies in other economies—by implementing cross-currency DVP linkages.

It was agreed that further analysis from the business, operational, and legal perspectives will be needed. Accordingly, this desktop study's results will not necessarily be absolute and final.

Processing Flow

As a major outcome of the study, Figure 1 depicts the normal processing flow of real-time DVP in HKD CHATS for settling a securities transaction in BOJ-NET JGB Services.



The life cycle of this DVP settlement includes the following processes as outlined in Table 1.

Table 1: Cross-Currency Delivery Versus Payment Settlement Processes

Process	Description
1. Matching data (local matching)	<ul style="list-style-type: none"> BOJ-NET users (Bank A or Bank B) can input transaction data (matching data) via BOJ-NET. Generally, Bank A is assumed to send the matching data to BOJ-NET.
2. Notification of receipt of matching data	<ul style="list-style-type: none"> Upon receipt of the matching data, BOJ-NET sends an acknowledgment (notification of receipt of matching data) to both Bank A and Bank B. Either Bank A or Bank B can cancel the matching data until BOJ-NET executes the securities settlement instruction from Bank A.
3. Securities settlement instruction	<ul style="list-style-type: none"> Bank A sends a securities settlement instruction to BOJ-NET. Bank A cannot cancel the securities settlement instruction after sending it to BOJ-NET. If it does not receive the securities settlement instruction by the cut-off time, BOJ-NET cancels the corresponding matching data.
4. Blocking of securities	<ul style="list-style-type: none"> BOJ-NET blocks JGBs in Bank A's account and sends notification of the blocking of securities to both Bank A and Bank B. If the blocking of securities is unsuccessful, BOJ-NET cancels the securities settlement instruction and sends a notification of cancellation of securities settlement instruction to Bank A. The matching data remains in BOJ-NET until the cut-off time. After the cut-off time, BOJ-NET cancels the securities settlement instruction and the matching data.

continued on next page

Table 1 continued

Process	Description
5. Notification (request for funds transfer)	<ul style="list-style-type: none"> • If the blocking of securities is successful, BOJ-NET sends a notification (request for funds transfer) to CHATS. • After validating the notification, CHATS sends a notification (request for funds transfer) to Bank Y. • If the validation is unsuccessful, CHATS cancels the notification (request for funds transfer) and sends a notification of cancellation of request for funds transfer to BOJ-NET. BOJ-NET releases the blocked securities and sends a notification of release of securities to both Bank A and Bank B.
6. Cash settlement	<ul style="list-style-type: none"> • Bank Y sends cash settlement instruction to CHATS.
7. Funds transfer	<ul style="list-style-type: none"> • After receiving the cash settlement instruction from Bank Y, CHATS debits Hong Kong dollars from Bank Y's account and credits the same amount to Bank X's account. • If cash settlement is unsuccessful, CHATS places the cash settlement instruction in the queue. CHATS effects the cash settlement instruction once Bank Y has sufficient funds in its account.
8. Notification of completion of cash settlement	<ul style="list-style-type: none"> • CHATS returns notification of completion of cash settlement to BOJ-NET upon successful cash settlement. • CHATS sends debit advice to Bank Y and credit advice to Bank X.
8*. Unsuccessful cash settlement	<ul style="list-style-type: none"> • Bank Y can cancel the queued cash settlement instruction. • If cash settlement is cancelled or not completed by the cut-off time, CHATS sends cancellation notification to BOJ-NET. BOJ-NET releases the blocked securities and sends notification of release of securities to both Bank A and Bank B.
9. Transfer of securities	<ul style="list-style-type: none"> • BOJ-NET transfers securities from Bank A's account to Bank B's account.
10. Notification of completion of DVP	<ul style="list-style-type: none"> • BOJ-NET sends notification of completion of DVP to both Bank A and Bank B.

BOJ = Bank of Japan, CHATS = Clearing House Automated Transfer System, DVP = delivery versus payment, JGB = Japanese Government Bond.

Messages between the Central Securities Depository and the Real-Time Gross Settlement Systems

The HKD CHATS and the BOJ-NET JGB Services would communicate with each other via a service vendor's communications media. An interface (gateway) would be established for each system to translate domestic messages into standardized interface messages (ISO 20022).

The BOJ and the HKMA have proposed tentative interface messages and essential (minimum) items to be transferred between CHATS and BOJ-NET (Tables 2 and 3). However, both the BOJ and the HKMA agreed that further discussions and studies on the detailed formats and specific fields may be needed.

Table 2: Message (pacs.009) Items for Cash Settlement Information from Bank of Japan Financial Network System to Hong Kong Dollar Clearing House Automated Transfer System

Message Items	Definition
Message Identification	Point-to-point reference, as assigned by the instructing party, and sent to the next party in the chain to unambiguously identify the message.
Creation Date Time	Date and time at which the message was created.
Settlement Method	Method used to settle the (batch of) payment instructions (CLRG).
Instructing Agent	Specifies the details on how the settlement of the transaction(s) between the instructing agent and the instructed agent is completed.
Instructed Agent	Specifies the details on how the settlement of the transaction(s) between the instructing agent and the instructed agent is completed.
End-to-End Identification	Unique identification, as assigned by the initiating party, to unambiguously identify the transaction. This identification is passed on, unchanged, throughout the entire end-to-end chain.
Transaction Identification	Unique identification, as assigned by the first instructing agent, to unambiguously identify the transaction that is passed on, unchanged, throughout the entire interbank chain.
Interbank Settlement Amount	Amount of money moved between the instructing agent and the instructed agent.
Debtor	Financial institution that owes an amount of money to the (ultimate) financial institutional creditor (BICFI).
Debtor Agent	Financial institution servicing an account for the creditor (BICFI).
Creditor Agent	Financial institution servicing an account for the creditor (BICFI).
Creditor	Financial institution that receives an amount of money from the financial institutional debtor(BICFI).

Source: Bank of Japan and Hong Kong Monetary Authority.

Table 3: Message (pacs.002) Items for Cash Settlement Status from Hong Kong Dollar Clearing House Automated Transfer System to Bank of Japan Financial Network System

Message Items	Definition
Message Identification	Point-to-point reference, as assigned by the instructing party, and sent to the next party in the chain to unambiguously identify the message.
Creation Date Time	Date and time at which the message was created.
Settlement Method	Method used to settle the (batch of) payment instructions (CLRG).
Instructing Agent	Specifies the details on how the settlement of the transaction(s) between the instructing agent and the instructed agent is completed.
Instructed Agent	Specifies the details on how the settlement of the transaction(s) between the instructing agent and the instructed agent is completed.
Original Message Identification	Point-to-point reference, as assigned by the original instructing party, to unambiguously identify the original message.
Original Message Name Identification	Specifies the original message name identifier to which the message refers.
Transaction Status	Specifies the status of a transaction, in a coded form.

Operating Hours

The operating hours of the DVP linkage between the BOJ and the HKMA would be 8:30 a.m.–4 p.m. Hong Kong Time (HKT) and 9:30 a.m.–5 p.m. Japan Standard Time.

Cross-currency repo transactions would be processed on an RTGS basis during the operating hours of DVP linkage. To ensure that all DVP transactions submitted for settlement are processed on the intended settlement date, the following cut-off times (Table 4) would be set by the BOJ and the HKMA.

Table 4: Cut-Off Time for Cross-Currency Delivery Versus Payment between the Bank of Japan and the Hong Kong Monetary Authority

	Event	HKD CHATS	BOJ-NET
1.	Start of DVP processing	8:30 a.m. HKT (9:30 a.m. JST)	8:30 a.m. HKT (9:30 a.m. JST)
2.	Cut-off time for receiving securities settlement instruction from Bank A		3:30 p.m. HKT (4:30 p.m. JST)
3.	Cut-off time for receiving notification (request for funds transfer) from BOJ-NET	3:40 p.m. HKT (4:40 p.m. JST)	
4.	Cut-off time for receiving notification of completion of cash settlement (or notification of cancellation of request for funds transfer) from HKD CHATS		3:50 p.m. HKT (4:50 p.m. JST)
5.	End of DVP processing	4 p.m. HKT (5 p.m. JST)	4 p.m. HKT (5 p.m. JST)

BOJ = Bank of Japan, CHATS = Clearing House Automated Transfer System, DVP = delivery versus payment, HKD = Hong Kong dollar, HKT = Hong Kong Time, JST = Japan Standard Time.

Source: Bank of Japan and Hong Kong Monetary Authority.

Contingency Measures

To avoid transmitting systemic risk across borders, the contingency measures for the CSD–RTGS linkages should be designed to satisfy the Principles for Financial Market Infrastructures—as outlined by the Committee on Payments and Market Infrastructures of the Bank for International Settlements—and enable the financial market infrastructure to complete settlement within the settlement day as much as practical, unless the circumstances are exceptional. In this regard, the BOJ and the HKMA categorized the envisaged contingency situations into the four cases detailed in Table 5.

Table 5: Contingency Cases

Scenario	Contingency Measures
1. Outage of HKD CHATS or BOJ-NET	<ul style="list-style-type: none"> • Operations would be transferred to a backup center so that cross-border DVP settlements continue. • If necessary, the BOJ and the HKMA consult each other and extend cut-off times.
2. Disruption among HKD CHATS members or BOJ-NET members	<ul style="list-style-type: none"> • Members would be encouraged to activate their own means of backup facilities or other backup tools.
3. Disruption of network connecting HKD CHATS and BOJ-NET	<ul style="list-style-type: none"> • Activation of backup facilities by service vendor would be assumed.
4. Failure in sending notifications from HKD CHATS to BOJ-NET	<ul style="list-style-type: none"> • The BOJ and the HKMA would check the status of transactions and communicate with each other as soon as possible. • Contingency communication arrangements between the BOJ and the HKMA would need to be determined.

BOJ = Bank of Japan, CHATS = Clearing House Automated Transfer System, DVP = delivery versus payment, HKD = Hong Kong dollar, HKMA = Hong Kong Monetary Authority.

Source: Bank of Japan and Hong Kong Monetary Authority.

Policy Recommendations and Road Map

The first CSIF report, *Basic Principles on Establishing a Regional Settlement Intermediary and Next Steps Forward*, made the following recommendations:

- (i) Each economy in the region is encouraged to establish cross-border, bilateral linkages between national CSD and RTGS systems when markets are sufficiently developed, infrastructures are ready to be linked, and the linkages will bring significant benefits to the home economies.
- (ii) In establishing the bilateral linkages, each economy in the region should apply the basic principles on establishing a regional settlement intermediary.
- (iii) Through, and in parallel with, works to establish bilateral linkages, each economy should continue efforts to facilitate standardization and harmonization of rules and regulations as appropriate, which would increase transactions and the cost-efficiency of cross-border bond transactions in the region.
- (iv) As a long-term perspective, a practical integrated solution should also be considered, assuming that the number of bilateral linkages would increase to the extent that an integrated model is viable.

To facilitate relevant works and in accordance with the recommendations above, the CSIF sets out the road map on establishing an RSI, which comprises three implementation phases and an integration phase (Figure 2). The CSIF would regularly monitor the implementation of the road map, making revisions as necessary. Implementation phase 1 (2015–2016) will specify essential user requirements, including messages and their items to effect cross-currency DVP settlement for CSD–RTGS linkages. Implementation phase 1 will also examine possible challenges for implementing the CSD–RTGS linkages, including legal barriers and market-practice-related impediments.

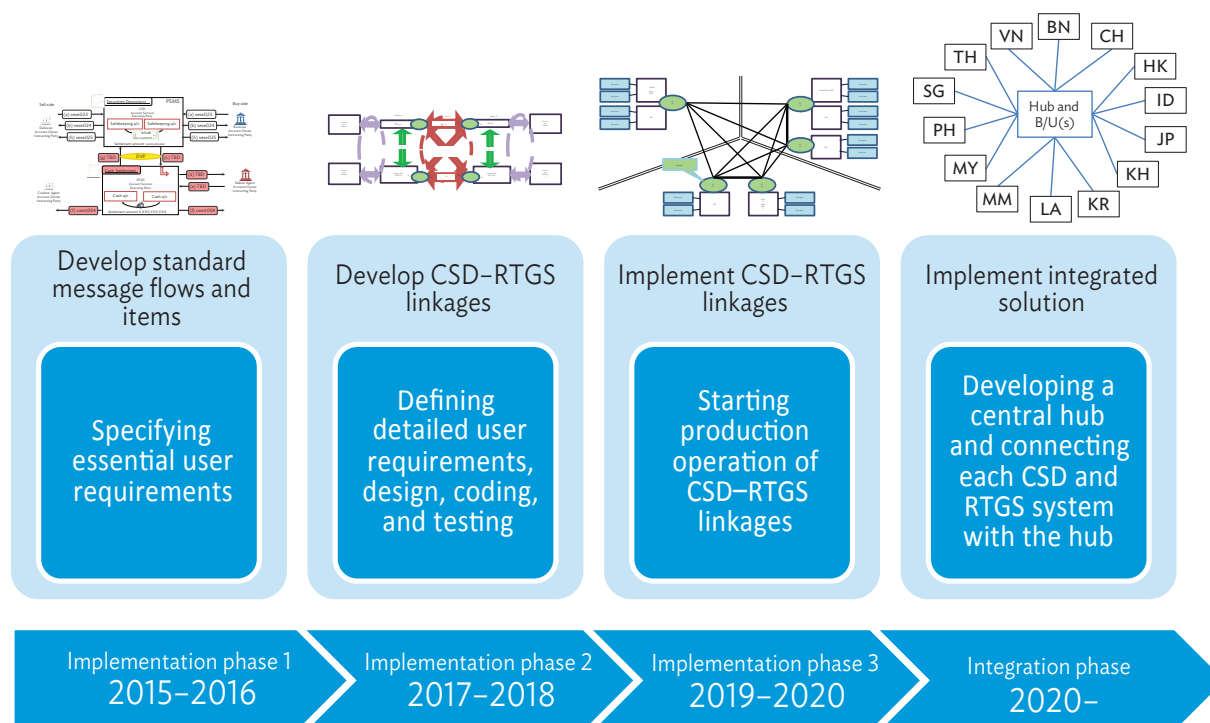
Implementation phase 2 (2017–2018) is the development phase of the CSD–RTGS linkages for cross-currency DVP settlement. Interested national CSDs and central banks will define detailed user requirements, design, coding, and testing. Other necessary user requirements, such as business continuity planning and information security, will also be defined. Depending on the interests of CSIF members, implementation phase 2 will also specify essential user requirements for other types of CSD–RTGS linkages, including CSD–CSD linkages and RTGS–RTGS linkages for PVP. The CSIF will provide technical assistance to members who are not ready to implement CSD–RTGS linkages in this implementation phase.

Implementation phase 3 (2019–2020) will see the start of production operations of CSD–RTGS linkages for cross-currency DVP settlement. In implementation phase 3, interested members will develop other types of CSD–RTGS linkages, including CSD–CSD linkages and RTGS–RTGS linkages for PVP. Depending on the expansion of CSD–RTGS linkages among ASEAN+3 member economies, the CSIF will also begin discussions on the future implementation of integrated solutions in this phase.

In the integration phase, the CSIF intends to expand the implementation of CSD–RTGS linkages within ASEAN+3. At the same time, the CSIF will also establish a hub for individual bilateral linkages.

The long-term goals of the RSI include (i) deeper and more liquid bond markets in ASEAN+3, (ii) government debt treated as an asset in ASEAN+3 economies, and (iii) interoperability of CSD–RTGS linkages not only within ASEAN+3 but also with other regions.

Figure 2: Road Map for Establishing a Regional Settlement Intermediary in ASEAN+3



BN = Brunei Darussalam; CN = People's Republic of China; HK = Hong Kong, China; ID = Republic of Indonesia; JP = Japan; KH = Kingdom of Cambodia; KR = Republic of Korea; LA = Lao People's Democratic Republic; MM = Republic of the Union of Myanmar; MY = Malaysia; PH = Republic of the Philippines; SG = Republic of Singapore; TH = Kingdom of Thailand; VN = Socialist Republic of Vietnam.

Remaining Challenges and Next Steps

CSIF members interested in establishing CSD–RTGS linkages for DVP settlement of cross-currency repo need to consider individual implementation time lines and pursue (i) further study on planning and developing a link interface; and (ii) a basic agreement on the essential matters, including normal and contingency operational arrangements.

The CSIF will continue to serve as a place to share information on various developments in cross-border securities settlement infrastructure within the ASEAN+3 region. In addition, to support the expansion of bilateral CSD–RTGS linkages among ASEAN+3 regions, the CSIF would identify and prioritize possible implementation challenges, including legal barriers and market-practice-related impediments. If necessary, the CSIF could conduct a stock-taking exercise on identified challenges.

A list of presentations given at CSIF meetings is shown in Appendix 3.

APPENDIXES

APPENDIX 1

Members and Observers of the Cross-Border Settlement Infrastructure Forum and the ADB Secretariat

Cross-Border Settlement Infrastructure Forum Members

Brunei Darussalam	Autoriti Monetari Brunei Darussalam	Shaw Fhen Lim
Brunei Darussalam	Autoriti Monetari Brunei Darussalam	Hafizuddin Hassanuddin
Brunei Darussalam	Autoriti Monetari Brunei Darussalam	Mohd Zul Azmi Haji Mohd Ali
People's Republic of China (PRC)	People's Bank of China	Cheng Shigang
PRC	China Central Depository & Clearing Co.	Lei Huang
PRC	China Central Depository & Clearing Co.	Yan Jia
Hong Kong, China	Hong Kong Monetary Authority	Edsmond Lee
Hong Kong, China	Hong Kong Monetary Authority	Shu-pui Li
Hong Kong, China	Hong Kong Monetary Authority	Kwok Hung Lee
Hong Kong, China	Hong Kong Monetary Authority	Flora S. Y. Wong
Hong Kong, China	Hong Kong Monetary Authority	Anissa Wong
Hong Kong, China	Hong Kong Monetary Authority	Nancy Wang
Indonesia	Bank Indonesia	Aloysius Donanto Herry Wibowo
Indonesia	Bank Indonesia	Devi Riyanti
Indonesia	Bank Indonesia	Yura Adalin Djalins
Indonesia	Bank Indonesia	Astrika Nurcahyaningih
Indonesia	Indonesian Central Securities Depository (KSEI)	Gusrinaldy Akhyar
Indonesia	Indonesian Central Securities Depository (KSEI)	Delonika Yuki Putra
Japan	Bank of Japan	Akira Yokoya
Japan	Bank of Japan	Megumi Takei
Japan	Bank of Japan	Yuya Ueda
Japan	Bank of Japan	Takahito Yamada
Japan	Bank of Japan	Misa Takada
Japan	Japan Securities Depository Center	Yuji Sato
Republic of Korea	Bank of Korea	Byoung Mok Lee
Republic of Korea	Korea Securities Depository	Jong Hyung Lee
Republic of Korea	Korea Securities Depository	Eujin Kwon
Republic of Korea	Korea Securities Depository	Mandy Ku
Republic of Korea	Korea Securities Depository	Suju Kwon

continued on next page

Appendix 1 Table continued

Lao People's Democratic Republic (Lao PDR)	Bank of Lao PDR	Saysamone Chanthachuk
Lao PDR	Bank of Lao PDR	Phoutsala Omdala
Lao PDR	Bank of Lao PDR	Sengthavong Luanglath
Malaysia	Bank Negara Malaysia	Aden NadiaA Jabbari
Malaysia	Bank Negara Malaysia	Lailatul Akma Mohad Shukor
Malaysia	Bank Negara Malaysia	Hashim Zainal Hasfi
Philippines	Bangko Sentral ng Pilipinas	Bella Santos
Philippines	Bangko Sentral ng Pilipinas	Dulce Maria Valdivieso
Philippines	Bangko Sentral ng Pilipinas	Eleanor Turaray
Philippines	Bangko Sentral ng Pilipinas	Remedios Macapinlac
Philippines	Bangko Sentral ng Pilipinas	Reginald So
Philippines	PDS Group	Cesar Crisol
Philippines	PDS Group	Ma. Theresa Ravalo
Philippines	PDS Group	Eleanor Rivera
Thailand	Bank of Thailand	Chinda Yapanawech
Thailand	Bank of Thailand	Kuda Rananand
Thailand	Bank of Thailand	Phantitra Usanit
Thailand	Bank of Thailand	Ketkeaw Borvornniruttisai

Observers

Indonesia	Ministry of Finance, Fiscal Policy Agency	Vincentius Krisna Juli Wicaksono
Japan	Ministry of Finance	Katsuyuki Tomizawa
Lao People's Democratic Republic (Lao PDR)	Ministry of Finance	Boualith Khounsuy
Lao PDR	Ministry of Finance	Chanpasith Sengphaathith
Lao PDR	Ministry of Finance	Visada Sipaseuth
Cambodia	Ministry of Economy and Finance of Cambodia	Chantha Chhoeng
Cambodia	Ministry of Economy and Finance of Cambodia	Samnang Kann
Cambodia	Ministry of Economy and Finance of Cambodia	Vanny But
Republic of Korea	Ministry of Strategy and Finance	Kyungseol Min
Republic of Korea	Ministry of Strategy and Finance	Jaehyun Han

ADB Secretariat for the CSIF

Philippines	Asian Development Bank	Satoru Yamadera
Japan	Asian Development Bank (Consultant for CSIF)	Taiji Inui

APPENDIX 2

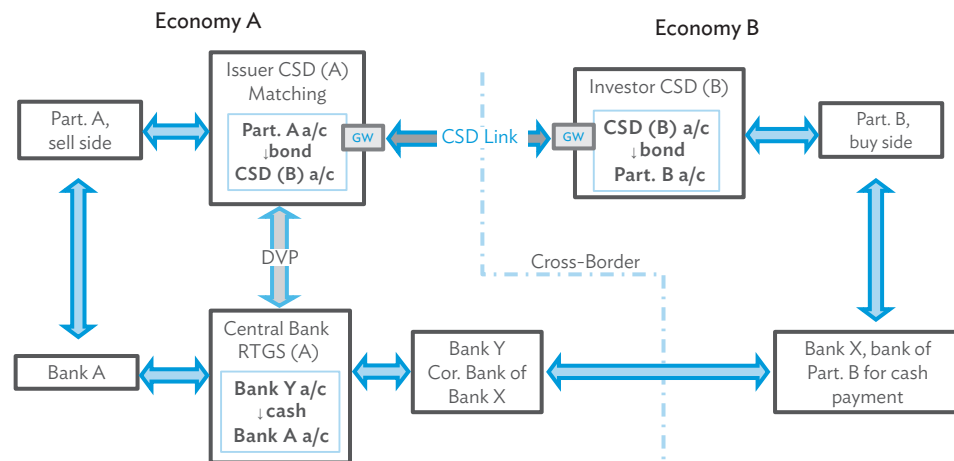
Outlines of CSD–RTGS Linkages

Cross-Border CSD–CSD Linkages

The sell side and buy side are located in different economies (A and B). The buy side is located in the investor CSD's economy (Economy B). The issuer CSD accepts the investor CSD opening an omnibus account.

- Participating CSDs assume two distinct roles. As issuer CSDs, they provide services to other participating CSDs for the securities for which they are the ultimate depository. As investor CSDs, they provide their customers with CSD services in markets other than their own by using the services provided by other issuer CSDs. In each case the service is provided by the issuer CSD to the investor CSD, and following that from the investor CSD to its participants.
- The target market for investor CSDs would be those that need full settlement capability across a large set of regional markets. The retail and private banks in the market of the investor CSD, as well as local and regional custodian banks, could fit this profile.
- Cash settlement for local currency in each economy is to be effected by the central bank's real-time gross settlement (RTGS) system. Cash settlement for currencies other than the local currency in each economy engaged is effected by a designated (private) settlement bank and is beyond the scope of this report.
- Issuer CSDs and investor CSDs are linked through gateways as shown in Figure A2.1.

Figure A2.1: Cross-Border CSD Linkage with Domestic Delivery Versus Payment



a/c = account, CSD = central securities depository, DVP = delivery versus payment, GW = gateway, RTGS = real-time gross settlement.

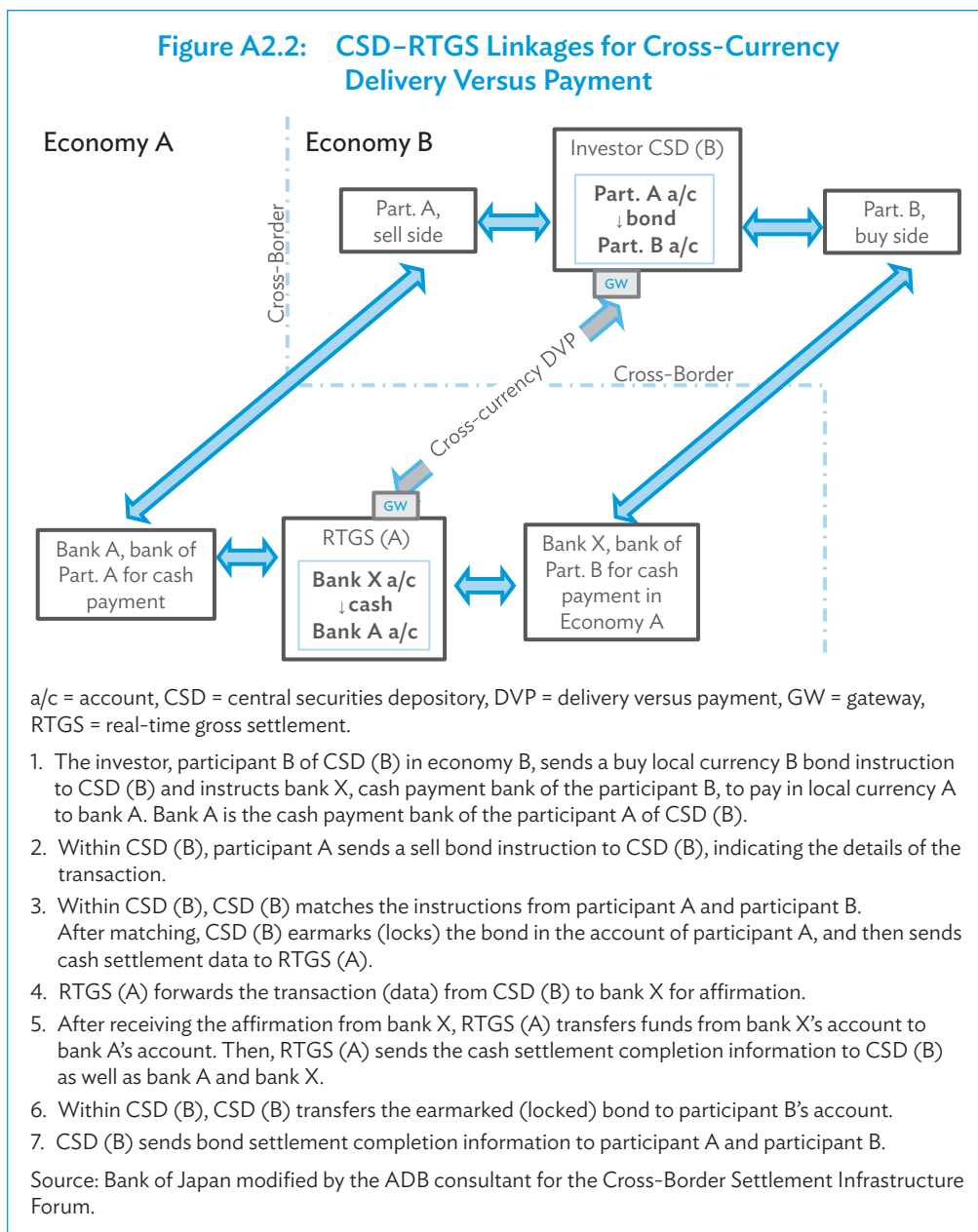
1. The investor, participant B of CSD (B) in economy B, sends a buy local currency A bond instruction to CSD (B) and instructs bank X, the cash payment bank of participant B, to pay through corresponding bank Y. Bank Y receives the payment instruction.
2. CSD (B) in turn sends the transfer in bond instruction to CSD (A) for matching.
3. Within CSD (A), the participant A of CSD (A) sends a sell bond instruction to CSD (A), indicating the details of the transaction.
4. Within CSD (A), CSD (A) matches the instructions from CSD (B) and the participant A. After matching, CSD (A) earmarks (locks) the bond in an account of the participant A, and then sends cash settlement data to RTGS (A).
5. RTGS (A) forwards the transaction (data) from CSD (A) to bank Y, the corresponding bank of bank X, for affirmation.
6. After receiving the affirmation from bank Y, RTGS (A) transfers funds from bank Y's account to bank A's account. Bank A is a bank for cash payment of participant A. Then, RTGS (A) sends the cash settlement completion information to CSD (A) as well as bank A and bank Y.
7. Within CSD (A), CSD (A) transfers the earmarked (locked) bond to CSD (B)'s account.
8. CSD (A) sends bond settlement completion information to participant A and CSD (B). CSD (B) sends the information to participant B.

Source: Bilateral linkages of CSDs based on the concept of Hong Kong Monetary Authority modified by the ADB consultant for the Cross-Border Settlement Infrastructure Forum.

CSD–RTGS Linkages for Cross-Currency Delivery Versus Payment

The sell side and buy side are located in the same economy (B). But the cash payment banks are located in a different economy from the CSD participants. The buy side and sell side are located in the investor CSD's economy (B). The bond is settled in a different local currency via cross-currency delivery versus payment (DVP). A sample cross-currency DVP linkage is shown in Figure A2.2.

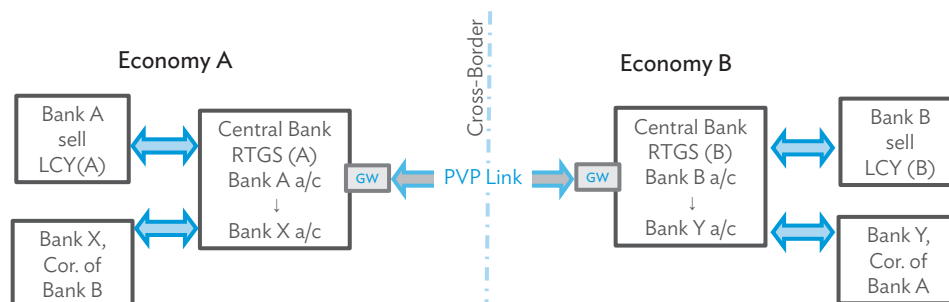
Figure A2.2: CSD–RTGS Linkages for Cross-Currency Delivery Versus Payment



RTGS–RTGS Linkages for Payment Versus Payment

Local currency A is sold and bought in economy A. Local currency B is sold and bought in economy B. By linking RTGS systems in economy A and economy B, local currencies A and B shall be settled simultaneously without having principal risk. A sample PVP linkage is shown in Figure A2.3.

Figure A2.3: RTGS–RTGS Linkages for Payment Versus Payment



a/c = account, CSD = central securities depository, GW = gateway, LCY = local currency, PVP = payment versus payment, RTGS = real-time gross settlement.

1. Bank A in economy A sends a sell local currency A and buy local currency B instruction to RTGS (A). Bank B in economy B sends a sell local currency B and buy local currency A instruction to RTGS (B).
2. RTGS (A) and RTGS (B) forward the information to gateways in economy A and economy B, respectively.
3. The gateways exchange and match the information.
4. When matched, each gateway sends an instruction to each RTGS to hold (earmark or block) the local currency funds of each economy.
5. After holding the funds, each RTGS sends a holding completion message to the gateway. The gateways exchange information with each other and confirm the holding of funds.
6. Each gateway forwards the information to the appropriate RTGS.
7. Each RTGS releases the held funds (local currency A to bank X's account and local currency B to bank Y's account).
8. Fund settlement confirmation is sent to bank A and bank B as well as counterparty RTGS through the gateways.

Source: Bilateral linkages of CSDs based on the concept of the Hong Kong Monetary Authority modified by the ADB consultant for the Cross-Border Settlement Infrastructure Forum.

APPENDIX 3

Presentations at the Cross-Border Settlement Infrastructure Forum Meetings

4th Cross-Border Settlement Infrastructure Forum Meeting

Hong Kong, China
September 2014

1. Kwok Hung Lee, Hong Kong Monetary Authority (HKMA); Taiji Inui, Asian Development Bank (ADB) consultant for the Cross-Border Settlement Infrastructure Forum (CSIF). Necessary requirements of connecting gateway for the CSD–RTGS linkages and possible road map
2. Akira Yokoya, Bank of Japan (BOJ). Scope and time line of the BOJ–HKMA desktop study
3. Jong-Hyung Lee, Korean Securities Depository (KSD); Taiji Inui, ADB consultant for the CSIF. Possible initiatives of the CSD–RTGS linkages
4. Yuji Sato, Japan Depository Securities Center. Current operation based on ISO 20022
5. Remedios Macapinlac, Bangko Sentral ng Pilipinas. Report on ASEAN WC–PSS.

5th CSIF Meeting

Manila, Philippines
January 2015

1. ADB Secretariat. Matters arising from the 4th CSIF Meeting at the HKMA in Hong Kong, China on 3 September 2014
2. Kwok Hung Lee, HKMA; Akira Yokoya, BOJ. Progress of the BOJ–HKMA desktop study
3. Satoru Yamadera, ADB. Reorganization of the ASEAN+3 Bond Market Forum Sub-Forum 2 and creation of new group under the CSIF
4. Taiji Inui, ADB consultant for the CSIF. Outline of CSIF report

Progress Report on Establishing a Regional Settlement Intermediary and Next Steps *Implementing Central Securities Depository–Real-Time Gross Settlement Linkages in ASEAN+3*

This progress report developed by the Cross-Border Settlement Infrastructure Forum (CSIF), composed of the central banks and central securities depositories in the Association of Southeast Asian Nations (ASEAN) and the People's Republic of China, Japan, and the Republic of Korea—collectively known as ASEAN+3, is an important step for the establishment of Central Securities Depository–Real-Time Gross Settlement (CSD–RTGS) Linkages as a regional settlement intermediary in the region. The report shows the desktop study results between the Bank of Japan and the Hong Kong Monetary Authority aiming to create a common model for the linkages. The report also sets out the implementation road map for establishment of CSD–RTGS Linkages. As secretariat of the CSIF, the Asian Development Bank supports this initiative.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to the majority of the world's poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

